

Soviet Russia

THE LAND AND ITS PEOPLES



THE KREMLIN

A view of from the Moskvoettsky Bridge. In the left background is the Cathedral of the Assumption with the Belfry of Ivan the Great.



SOVIET RUSSIA

THE LAND AND ITS PEOPLE

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AUTHOR'S PREFACE

This is a geography book about the Soviet Union but it is not a textbook. We have selected only the main features and do not claim to be exhaustive. Nor is it a guide to the USSR in the true sense of the word. In the main, we have divided the book into "journeys" because it is the traveler who sees most of the changing face of the country through which he passes. We must make it clear, however, that these "trips"^f are purely imaginary and have been plotted on the map in a way which introduces the reader to the most important features of our country.

These imaginary journeys are not necessarily trips that it would be easy, convenient or even possible to make with the same facility as we move from point to point on the map. That is why we would term them "Journeys on a Map" and not "Sightseeing Trips in the USSR." The selection of routes was made on purely geographical principles so that we can break off a journey at any point we wish, can turn aside from any main route and take our readers into hidden wildernesses where there is not even a path.

Although the book is not a traveler's guide we venture to hope that it will prove useful to all those who intend to visit the Soviet Union.

We show you the picture of our country today together with the changes that have taken place since the institution of Soviet power. The very landscape has changed and is still changing as a result of the process which turned yesterday's tsarist Russia into today's Union of Soviet Socialist Republics.

Moscow

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Soviet Russia

THE LAND AND ITS PEOPLES

1. MOSCOW AND ENVIRONS

I. THE KREMLIN

THERE ACROSS THE RIVER stands the ancient Kremlin, the center point of Moscow and the heart of the Soviet Union.

High above the blue mirror-like surface of the granite-bound river and beyond the row of green trees, is a high hill surrounded by a red fortified wall of fifteenth-century construction. The bricks of the Kremlin wall have a whitish hue as though they have been lightly touched by frost. The wall is surmounted by regular crenelations pierced by loopholes, the battlements from which the muzzle of cannon once projected and whence stones and boiling water were sent raining down on the heads of the attacking enemy.

The wall follows a scarcely perceptible zigzag at the angles of which are high towers with steep green-tiled roofs. On the highest towers five-pointed stars gleam golden; with the onset of darkness they flash forth rays of ruby light. The red five-pointed star is the emblem the men of the Red Army carried on their banners from Stalingrad to Berlin.

As we gaze across the river the Kremlin chimes ring out. On the finest of the towers, the Spasskaya or Tower of the Saviour, we see the face of an enormous clock, with gold figures and hands, which chimes the quarters. Whoever has listened to the Moscow radio station at midnight will recall the peculiar melody of these chimes.

Passing through the gates in the Spasskaya Tower we enter the Kremlin, the seat of the Soviet government. The traffic noises of the streets are immediately dulled by the thick brick walls. All around us in a courtyard paved with stone slabs and broken by numerous flower-beds, are monuments to the glory of Russia.

Side by side in the very center of the Kremlin are three old buildings—the three famous cathedrals. Cathedral of the Assumption, Cathedral of the Archangel and the Cathedral of Annunciation, built at the turn of the fifteenth and sixteenth centuries. Modest but powerful-looking cubes with smooth white walls, severe proportions, domes that resemble the helm of some knight of old—there is a simplicity and grandeur in these buildings. Especially attractive is the simple grace of the Cathedral of the Assumption. The magnificence of the interior decoration of the cathedrals is overwhelming.

Rising high above these cathedrals, like a gigantic white candle, is the two hundred and fifty-foot belfry of Ivan the Great, designed as a separate building; the sun is reflected warmly from its golden cupola.

At the base of Ivan the Great two interesting relics of Russia's past stand on a stone platform: the huge King Bell nearly sixteen feet high and the King Cannon, a piece of ordnance of truly regal proportions.

We seem to hear the pages of history rustle as they turn. Here is the Granovitaya Palata—the Chamber of Facets—where the tsars gave audience to foreign visitors. Next comes the whimsically designed Amusement Palace and then the Armory where the ancient royal regalia, the crowns and scepters, ancient arms and coins and captured battle standards are kept. Now we come to the old Arsenal against the walls of which is a stone plinth on which lie the hundreds of guns that the Russians took from Napoleon in 1812. There is a building with a big round dome designed by Matvey Kazakov, one of the greatest Russian architects of the eighteenth century. Next to it is the Grand Palace built in the nineteenth century; the architect of this latter build-

ing tried to imitate the ancient Russian style. It is surmounted by a flattened dome on which the State Standard flies.

In the Soviet period the interior of the Grand Kremlin Palace has been entirely reconstructed. In place of the gaudy Throne Room we now see the huge Session Hall of the Supreme Soviet of the USSR, simple, white, and light.

Stalin lives in the Kremlin. A few years ago the late Henri Barbusse said in his book on Stalin: "There, in the Kremlin, a place which resembles an exhibition of churches and palaces, stands a tiny three-storeyed house at the foot of one of the palaces. This little house (you would not notice it unless it were pointed out) was formerly inhabited by palace servants.

"We go up the stairs. At the windows there are white linen curtains. These three windows belong to Stalin's apartment." Henri Barbusse was astounded at the extreme modesty of the household arrangements of the leader of the Soviet people.

The office in which Stalin works is also in the Kremlin. It is equally modest—a writing desk, a bookcase, a vaulted ceiling, oak paneling on the lower part of the white walls, and a death mask of Lenin under glass.

II. THE CAPITAL CITY

THE stone steps of a dark staircase lead us to the top of the Belfry of Ivan the Great. As we come out on to the platform a gust of wind catches us and our hearts miss a beat as we get the feeling of height. All Moscow can be seen from here. Spread out below us is the city whose name has become not only a national but also a political symbol.

We look around us in all directions: on the horizon all the way round we see the dark-blue fringes of a forest. Within this framework, apparently itself a natural growth, lies the city. Moscow stands on a number of low hills so that here and there the streets rise and fall slightly. Right across the city winds the narrow ribbon of the Moscow River spanned in many places by

high bridges. The outlines of thousands of buildings surround us, the rippling roofs, the domes of the churches, and the tall factory chimneys.

During the past few years the Moscow landscape has changed considerably. In former days the most striking thing about a bird's eye view of the city was the rosy-golden hue that was characteristic of it and which was due to the large number of red-brick buildings and the gilded domes of hundreds of churches glittering in the sun. Today this hue is combined with that of light-gray concrete where the new many-storeyed houses have been built in such great numbers that their broad square outlines have begun to dominate.

In many places the crowns of green trees, mostly lindens, are visible amongst the buildings. There are comparatively few trees in the Moscow streets but we see from our high point of vantage that this defect is compensated by the greenery in the inner courtyards of the buildings; this planting of trees and shrubs in courtyards is a typical Moscow feature.

From the belfry we can see that the Kremlin lies in the very center of Moscow. Moscow itself is again the center of that part of the Soviet Union that is most densely populated. It is the center of the East European Plain, almost at the point where the diagonals of the European part of the USSR intersect. The distance from Moscow to the western frontier of the USSR is almost equal to that between Moscow and the Urals while the city is almost equidistant from Murmansk, the northernmost town in European Russia, and Batumi, the southernmost point on the Black Sea.

Moscow lies in the basin of the Volga and the Oka and straddles the Moscow River, a tributary of the Oka. The parallel which runs through Moscow continues through the extreme south of Sweden, Denmark, Scotland, Southern Labrador, Canada (northwards of the most populated part), the Aleutian Islands, Kamchatka, the northern tip of Lake Baikal in Siberia,

and the Urals (slightly south of Sverdlovsk). It is, therefore, a *comparatively northern city*.

The climate of Moscow is not so rigorous as one might expect from its northerly location. The Moscow summer is as warm as that of Central and Western Europe and of the district around New York. The average winter is not too severe, no worse than that of southern Canada or Northern Korea but much more rigorous than that of Western Europe. The snow lies in Moscow for over a hundred days.

Moscow is the biggest city in the USSR and one of the biggest in the world. The present population is over four million, two and a half times that of 1917, a tremendous rate of increase. The population of Moscow exceeds that of Denmark, Norway, Finland and several other countries.

From the height of the belfry of Ivan the Great we can see the plan of the city. The first thing we notice is that from the center of the city, from the Kremlin, radial streets stretch in all directions. Through a field glass we can see that beyond the city bounds these radial streets become arterial highways that follow the lines of the old unpaved roads which led from the capital city of Russia to all the biggest towns in the country. The names of the streets told of the towns to which they led: Tverskaya (now Gorky Street) led to Tver (now Kalinin), Dmitrovka (now Pushkin Street) led to Dmitrov, Serpukhovskaya to Serpukhov, Kaluzhskaya to Kaluga, and so on. One of these radial arteries is called Ordynka, a reminder that it once led to the capital of the Golden Horde, the Tatar-Mongols.

As the radial streets pass through the city, they cut across concentric rings of streets.

At a distance of less than a mile from the wall that rings the Kremlin is a second circle, today a wide boulevard. This modern boulevard follows the line of the fortified walls of the "White City"; the walls have long since been removed but in olden days they played an important part in the defence of Mos-

cow. The memory of the wall is retained in the squares through which the boulevard passes: Nikita's Gates, Pokrovsky Gates, Petrovsky Gates, etc., although naturally there are no gates there today.

Still farther from the center lies yet another circular street, the Sadovaya or Garden Circle, which follows the line of the ancient earthen rampart which formed another formidable obstacle to Moscow's enemies. This circle is today a very wide road some ten miles long, a very convenient by-pass to keep heavy traffic out of the center of the city. Until quite recently one of the sections of this wide asphalted street still bore the name of "Earthen Rampart."

The third and outer circle of the city is formed by the embankment of the Moscow Circular Railway which links up all the main railway lines that converge on Moscow. A few years ago the Circular Railway was the city boundary but today Moscow has burst its bounds in many places.

The plan of Moscow is like the cross section of an old tree trunk, which tells us that the city was not built according to a preconceived plan like Leningrad; further evidence of this is in the winding tangle of side streets that we see from our high perch.

Moscow was first settled eight centuries ago—its 800th anniversary will be celebrated in 1947. The first mention of Moscow in the Russian Chronicles refers to 1147 although a village in all probability existed before this time. At first Moscow was a small settlement on the present Kremlin Hill, the point where the Neglinnaya River (now carried underground through pipes) ran into the Moscow. In 1156 a wooden palisade was built around the village and it became a town.¹ This tiny fortress was destined to become the national center of the Russian people.

Moscow's growth was facilitated by its situation in the very center of the Russian lands and by the defensive belt of woods

¹ The Russian word for town, gorod or grad comes from the root meaning a fence or palisade. Any

walled or fenced settlement, therefore, was a town.

and swamps that surrounded it and protected it from the frequent and devastating raids of its enemies—the Tatar-Mongols and the Lithuanians. Another point in favor of Moscow's growth was its position on the busy waterways that connected Novgorod Russia in the north with the middle and lower reaches of the Volga and thence with the East. Moscow developed rapidly and soon outgrew all the other Russian towns.

Moscow in those early days was in the throes of feudal disunity. The turn of the fifteenth and sixteenth centuries saw the unification of the Russian lands around Moscow, a process which later Russian historians called the "Assembly of Russia." It was about this time that the Tatar yoke was finally thrown off.

Moscow grew together with the Russian state. On many occasions the city was destroyed by its enemies, on many occasions it was razed to the ground by great conflagrations but each time it arose again from the ruins and ashes and built anew, each time more beautiful and richer than before.

Foreign travelers who visited Moscow declared that it was one of the biggest, most beautiful, and richest cities of the Europe of those days. As the heart of a powerful state, as a city with an aspect entirely its own in which the features of East and West were combined, Moscow always excited special interest.

At the beginning of the eighteenth century the Russian Tsar, Peter the Great, the reformer of Russia, transferred the capital from Moscow to the city of St. Petersburg which he had newly built on the banks of the Gulf of Finland as "a window looking into Europe." The importance of Moscow, however, still remained very great.

The national significance of Moscow was greatly enhanced after the events of 1812, the year in which Napoleon attacked Russia and marched on Moscow with his huge army. The Russians greatly weakened Napoleon's army in the blood-bath at Borodino, a village near Moscow, but in order to preserve the man power of the army they abandoned Moscow and retreated.

The Russians themselves fired their beloved city and in the flames of that conflagration Napoleon's fame was burnt. The weakened French Army had begun to disintegrate; the French soon left the ash-heaps of Moscow and began to retreat westward. Pursued by a strengthened Russian Army, the retreat developed into a flight which ended in the complete destruction of Napoleon's "Grande Armée." With the aid of the best architects of all Russia, Moscow, the epitome of self-sacrifice and victory, was rebuilt in an incredibly short time.

Nineteenth-century Moscow played an exceptionally important part in the cultural development of Russia. Many great statesmen came from Moscow; it was famed as the seat of the country's oldest university, and it founded the great traditions of the Russian theater.

Moscow gradually became an industrial center. Factories and mills were built.

In 1918 when the capital was again transferred to Moscow from Petrograd it became the political center of the Soviet Union, the capital both of the whole Union and of its biggest republic, the Russian Soviet Federated Socialist Republic. It is here that the Supreme Soviet of the USSR meets, and here are also to be found the Soviet Government and all the central government institutions.

Moscow is the biggest cultural center of the Soviet Union. The country's highest scientific institution, the Academy of Sciences of the USSR, and many of its institutes are in Moscow. There are more than seventy higher educational establishments and many fine museums in the city; there is also the Lenin Public Library, one of the world's biggest book repositories. Moscow's theaters are famed throughout the world.

MOSCOW

First mention: (in Chronicles) 1147 A.D.

Population: (1939) 4,137,000.

Average temperatures:

January 10° below zero C. July 18° C.

Annual rainfall—613 mm.

Geographical situation:

55°45' N. Lat. 37°37' E. Long.

Moscow lies in the second hour zone—noon in Moscow is 11 A.M. in Berlin, 10 A.M. in London and Paris and 5 A.M. in New York.

Economic profile: Biggest industrial center of the USSR (before the war produced 16% of the total industrial output). Chief industry—engineering, especially intricate and precision machines. Biggest factories—Stalin Automobile Plant (ZIS), the Ballbearing Plant, the Dynamo Electrical Goods Plant, and a number of other electrical goods plants, machine-tool plants, watch and clock factories, etc. Important production of high-grade steel (Hammer and Sickle Plant). Chemicals. Well developed textile industry, especially cotton piece goods. Various branches of light industry and food processing industry. Largest printing works in country. Several power stations including heat and power generating stations. Important center for the training of personnel for industry.

Cultural Institutions: the Academy of Sciences of the USSR with many research institutes, the Academy of Medical Sciences of the USSR, the Academy of Pedagogical Sciences of the R.S.F.S.R., a number of military academies, over 70 higher educational establishments, the Lenin Public Library, the Planetarium, etc.

A number of research institutions belonging to various branches of industry, the well-known Central Aero- and Hydrodynamic Institute among them. The Central House of the Red Army.

Museums include: the Lenin Museum, the Museum of the Revolution, the Polytechnical Museum, the Pushkin Museum of

Fine Arts, the Museum of Western Painting, the Tretyakovsky Gallery, the Boyar Museum, the Pushkin Museum, the Leo Tolstoy Museum, the Literary Museum, the History Museum, the Exhibition of Trophies (captured during the Second World War).

Theaters include: the Grand Theater (Moscow Opera House), the Moscow Art Theater, the Maly Theater, the Vakhtangov Theater, the Mossoviet Theater, the Central Red Army Theater, Operetta Theater, several children's theaters and a puppet theater. *Philharmonics* (Conservatory Concert Hall, House of the Trade Unions, Tschaikovsky Hall and others). The country's chief broadcasting center.

Moscow newspapers include: *Izvestia*, *Pravda*, *Red Star*, *Komsomolskaya Pravda*, *Trud*, and others. There are several publishing houses.

Moscow is the biggest and most rapidly growing industrial center of the USSR. Its output today is almost double that of the whole Russia in pre-revolutionary times. During Soviet times the character of Moscow's industries has undergone a great change.

New engineering, electrical, and chemical plants have been built. Heavy industries has become more important to the city than light industry. The growth of heavy industry, however, does not mean that light industry has decreased although it developed less rapidly than heavy industry. During the period of the Five-Year Plans, the output of textiles, for example, was increased several times over.

Moscow is the center of an extensive electric power grid and is one of the biggest electric power producers in Europe. Moscow is a big railway center where a large number of main lines converge: some of them are electrified where they enter the Moscow suburbs. Since the Moscow-Volga Canal was built the capital has been connected directly with the Volga, the country's main waterway, and through the Volga with the Caspian Sea; through what is known as the Mariïnsk system of rivers

and canals the city is connected with the Baltic and White Seas.

The rapid growth of the city made radical reconstruction necessary. Moscow was a closely packed city with few amenities; two-thirds of the houses were of timber, a third of the population lived in hutments and factory barracks, a tenth of the people lived in cellars. The streets were paved with cobbles and all except the center was lit with oil lamps. Urban transport was poor, electric trams appeared at the beginning of the century but horse trams were in use almost up to the revolution.

During the period covered by the Five-Year Plans the reconstruction of the city was undertaken. A general plan for this new Moscow was drawn up under Stalin's guidance and was approved by the government in 1935. This project includes the replanning of the various city districts without, however, interfering with the general outlines of the city, the more rational location of industrial concerns and dwelling houses, the reorganization of urban transport and warehouse accommodation, the building of new drains, the straightening and widening of streets and the expansion of the city in a southwesterly direction into the most healthful and picturesque country in the vicinity of the city. A forest belt with a radius of six miles will encircle new Moscow and wide arterial highways will cut across the city at all angles.

Today most of Moscow's streets have been asphalted and many of them have been widened. In widening streets the smaller buildings of no historical or artistic importance were removed and some buildings were moved bodily. The country's leading architects designed the fine new buildings that now adorn the city—the Hotel Moskva, the Offices of the Council of Ministers, the Central Red Army Theater, the American Embassy and many others. Dwelling houses of from six to fourteen floors have been built in all sections and about four hundred new schools accommodate the children that live in them. The new bridges that have been thrown across the Moscow River are exceptionally long and wide; the Moskvoretsky

Bridge near the Kremlin is 2,350 feet long and 130 feet wide. In some parts Moscow has changed beyond all recognition. Since the war ended reconstruction work has continued.

The building that has been designed for the Palace of Soviets will form the central landmark of Moscow. It will be a gigantic building the Central Hall of which is planned to accommodate twenty-one thousand people for special meetings and festivals. The total height of the Palace will be almost 1,350 feet which will make it the tallest building in the world. The Palace will be surmounted by a colossal statue of Lenin that will be visible for dozens of miles in all directions apprising the traveler that he is approaching the Soviet capital.

For many years Moscow had been short of water and drank about a half the shallow Moscow River every year. Only vessels with a very small draught could reach the city so that the river port handled less than a tenth of the quantity of goods handled by the railways. Such bulky freights as timber, oil, and building materials came to Moscow by rail and not by water.

The Moscow-Volga Canal, eighty miles in length was built between 1932 and 1937. The dam on the upper reaches of the Volga, to the north of Moscow, raised the level of the Moscow River and flooded an area of one hundred and twenty-six square miles forming the "Moscow Sea." A power station was built at the dam and is worked by the waters of the Volga. Part of the impounded water is diverted into the Moscow-Volga Canal. At the locks on this canal there are five powerful pumping stations which use huge rotary pumps to carry the water over the ridges. Naturally this requires a large expenditure of electric power but part of it is returned by a number of power stations, small ones it is true, built on the canal.

After the canal had been built there was five times as much water in the Moscow River as there had been formerly. Large vessels now make the trip from the Volga to Moscow which has become a deep-water port.

Part of the Volga water, after standing for a hundred days in

a forest filter bed is passed on to the Moscow water mains. The city now has an adequate supply of water.

The architectural treatment of the canal is very interesting. All the installations—locks, dams, pumping stations—have been designed to harmonize with the surrounding landscape. A restful holiday greatly favored by Muscovites is a trip to Kalinin or Uglich and back on the comfortable passenger steamers that ply the canal in summer.

The Moscow River Port Buildings at Khimki on the north-western outskirts of the city themselves resemble a light, airy, white bark that is about to set sail on the blue waters of the reservoir which form the background. All the buildings belonging to the Canal Authority are decorated with statuary—here we see Stalin, there the ships of Columbus. The ribbon of water lies between level green banks which at night are studded with the rubies of the signal lamps. The landscape is calm and pleasant and the soft lapping of the waves has a soothing effect as the vessels slip quietly along. On the artificial lakes, ringed around with tall conifers, tiny yachts with their triangular white sails dart about like sea gulls. In winter when the lakes are frozen the smooth sheets of ice are used as skating rinks.

Moscow has its underground railway. The three lines that have already been built cut right across the diameter of the city in different directions. The stations of the underground have such luxurious architectural treatment in marbles and colored stone ceramics and stainless steel, that they remind one of subterranean palaces. The lighting of the Moscow Underground Railway is from two to four times greater than that of any similar railway in the world. The amount of fresh air pumped into the stations is one and a half times greater than the amount used in New York. During the war the building of the new underground lines continued. The stations that were opened during those years have a magnificence all of their own as though they reflect the confidence felt by the Soviet people that they would be victorious.

In the autumn of 1941 the city was blacked out and air raids were a daily occurrence. Barrage balloons filled the sky and the streets were protected by barricades and trenches. The Moscow people turned out in their thousands to build fortifications around their city.

The Germans tried to seize the city by a pincer movement from the north and south. The city lay between the two prongs of a German horseshoe. Hitler was confident that the city would fall and on a certain day ordered all newspapers to leave a blank space in which to announce the capture of Moscow.

Each arm of the German pincers, however, was caught in Soviet pincers and the German Army was completely routed.

Hitler suffered his first big defeat at Moscow; this battle showed the possibility of defeating the Germans. The Battle of Moscow did not end the war but it played an important role and in many ways decided the outcome of the conflict.

III. THE MOSCOW STREETS

TO THE east of the Kremlin lies the Red Square, the old Forum of Moscow. In the days of ancient Muscovy this was a central market place but even in those days the Red Square had a social and political significance; the most important of the tsars' ukases were announced on the Red Square and it was the scene of all triumphal processions.

On the modern Red Square stands the Lenin Mausoleum where lie the remains of the founder of the Soviet Union who died in 1924; demonstrations of the people, sports and military parades well known to the whole world take place on the Red Square. Here on national holidays Stalin greets the Soviet people.

In outward appearance the Red Square is unique, there is nothing in the whole world with which one can compare it. It is paved with stone blocks laid in such a fashion that they resemble mail armor, especially when they glisten after rain. From two sides of the square the roads lead downhill so that

the square itself seems to be raised above the town. There is a constant stream of motor traffic through the square all day but its volume is less than that of the other central streets and squares of Moscow; even at the hours of the traffic peak there is a solemn calm about the square which is emphasized by the chimes of the clock on Spasskaya Tower every quarter of an hour.

The western side of the square is fringed by the crenelated wall of the Kremlin. Below the wall is a long line of fir trees planted in memory of the dead. Immured in the Kremlin wall are urns with the ashes of prominent Soviet people of the past—Kirov, Orjonikidze, Gorky. Parallel to the wall are long rows of gray stone stands rising in several tiers where the guests are accommodated at parades. The line of the stands is broken in the center to provide room for the Lenin Mausoleum.

The Lenin Mausoleum is a small terraced building of black and red marble. Its polished angles produce an impression of both sorrow and strength. At the door two Red Army soldiers are always on guard.

Lenin's body, dressed in a khaki tunic, lies under glass. Soviet scientists, after considerable research work, found a means of embalming the body which makes it everlasting. Lenin seems to have fallen asleep.

On the Mausoleum, behind the parapet where the word "Lenin" is inlaid in red on black, there is a small space used as a tribune. On festival days the leaders of the Soviet State and the generals of the Red Army take their places on this platform.

From the southern side of the square there is a wide street leading down to the Moscow River; in the center of this street stands the sixteenth-century Cathedral of St. Basil the Beatified. The Cathedral is a miracle of the old Russian builders' art; it is a building which incorporates the artistic genius of the Russian people. The designs on the walls, porches, and staircases are like wood-carving done in stone. The cathedral is surmounted by a number of cupolas picturesquely grouped around a central

dome; each of these cupolas is of different design—ribbed, whorled, fluted—and painted different colors—red, yellow, blue. Even people who have crossed the Red Square hundreds of times never pass the Cathedral of St. Basil without an admiring look.

Near the cathedral there is a monument to Minin and Pozharsky, leaders of the bands of Russian citizens who liberated the Russian capital from the Poles in 1612. The inscription on the pedestal of the monument reads: "To Citizen Minin and Prince Pozharsky from Grateful Russia."

The northern side of the square is occupied by the red building of the Museum of History built in the nineteenth century in the so-called "Russian style," with little towers and brick ornamentation. In the same style, which tried to imitate the architectural designs of ancient Russia, there is also the building known as the Upper Trading Rows; this building is of lighter color and occupies the eastern side of the square. It originally consisted of rows of shops arranged in galleries on three storeys; the part of the building facing the Red Square is now occupied by the offices of government departments and trading concerns.

On one side of the Red Square is the Kremlin, on the other is Chinatown, the ancient trading and business center of Moscow, its old City. From very early times Chinatown was surrounded by a wall. As the town grew the wall hindered the increasing traffic until today almost all of it has been removed. There is still a part standing along the Moscow River and one or two small pieces of a low grayish wall with battlements and loopholes in other parts of Chinatown. These remnants of the wall have been overgrown with grass in the course of time and in some places even small trees have taken root.

The names of some of the streets that have been retained still tell of the former functions of this part of Moscow—Glass Lane, Fish Lane, Old Rag Row. This was the trading world, the booths were arranged in rows each of which was occupied by those who traded in one particular class of goods. For cen-

turies the merchants of Moscow met those from the East and West in Chinatown; there was always a brisk trade in furs, fabrics, and weapons. The development of economic life was greatly hampered by the walls of Chinatown so that the buildings inside this section of Moscow are huddled close up to each other and the streets wind and twist without any sort of plan or system.

Beginning with the end of the nineteenth century the buildings of banks and the Bourse were added to the little shops and warehouses of Chinatown. The banks were accommodated in big modern buildings with expanses of windows. Ilyinka Street (now called Kuibyshev Street) became the street of banks. The Bourse was also on this street.

Today the life of Chinatown has changed for there is no private trading and no privately owned banks. Historical succession, however, still continues and Chinatown has remained a purely business section of Soviet Moscow where there are various offices and state-owned wholesale warehouses. Here we find the country's chief financial organization, the Ministry of Finance of the USSR, a number of Soviet banks, foreign trade institutions, etc.

We leave Chinatown in a northerly direction where the central squares of Moscow merge into one another in a long chain running parallel to the Kremlin and Chinatown. This is the theater section of Moscow. There are few dwelling houses, most of the territory being occupied by offices and public buildings, hotels, museums, cinemas, and, predominating, the theaters.

In the center is Sverdlov Square which was formerly called Theater Square.

Let us take a look at the square standing with our backs to Chinatown. The part of the square nearest to us is asphalted and is quite empty except for a huge fountain playing in the middle. The farther half of the square is occupied by a small garden with brightly hued flower beds: around the edge of this little garden a row of apple trees has been planted—a little

orchard in the middle of a noisy city that pleases the eye with its white blossoms in spring and its little, rosy-checked apples in autumn. Farther still from where we stand, beyond the fountains and the garden rises the huge building which gives character to the whole square. This is the Bolshoy (Grand) Theater, the Moscow Opera House. It has a classical columned façade surmounted by a pediment above which stands the four-horsed chariot of Apollo cast in iron.

The Bolshoy Theater is famous for its opera and ballet companies and for its orchestra. It is one of the sights of Moscow. The interior of the theater consists of many tiers or galleries rising one above the other, all done in dark red and gold. There are never any vacant seats in this theater.

To the right of it we see the more modest building of the Maly (Little) Theater, the home of Russian drama for over a hundred years. The theater is the headquarters of the Russian realist theater school founded by one of the greatest of all Russian actors, Shchepkin. In Soviet times a monument to Ostrovsky, the famous playwright, has been erected against the walls of the theater. The monument is simple but unusual: in an armchair placed against the smooth wall of the theater sits a fine-looking old man done in bronze; he casts his benign look on the public as they enter the Maly Theater, "Ostrovsky's Theater" as it is called traditionally. There are always several of Ostrovsky's plays in the theater's repertoire.

To the left there is also a theater and quite near the square begins Pushkin Street which runs northward past a whole string of theaters: the Affiliate Bolshoy Theater, the Children's Theater and the Moscow Art Theater and its Affiliate.

The Moscow Art Theater was founded by two prominent Russian theatrical producers, Stanislavsky and Nemirovich-Danchenko, in 1898. The theater has made several trips abroad and has become quite well known to the foreign theater-goer. It is generally admitted that the Moscow Art Theater holds a top position on the list of the world's theaters. The acting of

its company reaches a very high level of artistic realism. On the gray drop curtain of the theater we see its emblem—a white sea gull—a reminder of the great part which the work of Anton Chekhov, author of the drama *The Seagull*, has played in the life of the theater.

Although the center of Moscow is rich in theaters there are many more in other sections of the city.

The museums form another aspect of Soviet cultural life well represented in the center. Near Sverdlov Square, at the point from which we first saw the Bolshoy Theater, there is the red brick building of the Lenin Museum. A large number of exhibits illustrates the life and work of the founder of the Soviet State.

Next to the Lenin Museum there is the Museum of History which we saw from the Red Square: this museum illustrates the history of our country. The same building houses the Pushkin Museum, devoted to the life of the poet.

If we turn southwest in the direction of the site of the future Palace of Soviets, we shall pass a number of museums: the Museum of Literature, the Fine Arts Museum, the Leo Tolstoy Museum, the Gallery of Western Painting. If we cross the Moscow River and enter a quiet side street opposite the Kremlin we shall see the Tretyakov Gallery where the greatest collection of Russian pictures is to be found.

Let us get back to Sverdlov Square, however. From the square we turn left into Okhotny Ryad, the Hunters' Row. A few years ago this was a cobble-paved market place lined with tiny shops and booths selling eatables of all kinds. Formerly only two buildings of importance towered over this bazaar, the House of the Trade Unions with its wonderful Hall of Columns for concerts and balls at one end, and the Hotel National at the other.

In the course of the reconstruction of Moscow this place has not only become difficult to recognize; it has changed completely. The booths and stalls have gone and in their place there

is a wide asphalted street with constantly moving streams of pedestrians on either side and two streams of fast moving motor traffic. Two huge buildings, typical of the new Moscow, line the Hunters' Row. If we walk down the street from the direction of Sverdlov Square we pass the magnificent, monumental gray stone building which houses the offices of the Council of Ministers on the right, while on the left there is the gigantic building, also gray, of the Hotel Moskva which despite its size does not give one the impression of unwieldiness.

As we leave the Hunters' Row we come to the big open space called Manège Square. In the old days this was not an open space: the whole area was a mass of small buildings that huddled closely against each other which were removed to leave an open square.

To the left the Manège Square is bordered by the Museum of History and part of the Kremlin Wall with its spire-topped towers; at the foot of the wall, in the place where the Neglinnaya River, now carried underground through pipes, once flowed, there is the Alexander Garden, a mass of green trees and shrubs. Beyond the Kremlin wall the walls and roofs of many of the Kremlin buildings can be seen, including the quaint old *terems* or women's quarters and our old friend, the white-trunked, golden-headed belfry of Ivan the Great.

Directly in front of us and closing the square from the far side is the building of the nineteenth century manège which gives the square its name. It is classical in style with rows of half-columns round the four walls: its roof beams have a span of 148 feet and are completely unsupported, except at the ends. At the time the building was designed this was a miracle of engineering.

The right-hand side of the square is bordered by a number of buildings each of which is architecturally interesting in itself. At the far end of the square we can see the round building of the University Library and the façade of the newer of the two University buildings, before which stands the monument to



OLD MOSCOW

St. Basil's Cathedral and (LEFT) the monument to Minin and Pozharsky.



MOSCOW AT WORK—

ABOVE:—Machine tool manufacture at the Red Proletarian factory.

BELOW:—Izmailov station on the Moscow subway.



Lomonosov, the eighteenth-century Russian scientist who founded Russia's first University. Nearer to us is the older building of the University partially hidden behind the trees of a small garden: this building is semiclassical in style with fluted columns and a flattish dome. Still nearer to us is the beautiful modern building of the American Embassy designed by the architect Zholtovsky in renaissance style.

To our right, with the building of the Council of Ministers at the corner, opens up the fine perspective of Gorky Street. This street has been greatly widened and bears little resemblance to the old Tver Street. At the beginning of the street on the left there is still a row of old buildings of various heights, although these are dominated by a modern building erected during the Soviet period, the Central Telegraph Office in which glass plays an important part in the architectural treatment; over the entrance is a globe with the map of the world in colors. The right-hand side of the street for a considerable distance has all new buildings, block after block of dwelling houses built by the architect Mordvinov and designed to form one complete ensemble. Gorky Street, beyond the limit of our vision, passes the Pushkin memorial, cuts through almost half of the city until it becomes the Leningrad Highway, one of the widest streets in the world; it is in reality four parallel streets separated by rows of trees. The Leningrad Highway, flanked on either side by blocks of new dwelling houses, leads to the "Dynamo" Sports Stadium, the Central Airport, and the Khimki River Port.

Thus, standing at the corner of the Hunters' Row we have let our eyes wander round Manège Square in a clockwise direction. Now let us pay a visit to some of the districts of Moscow farther from the center which have peculiar interest of their own.

In Moscow today there are still many traces of the time when the aristocracy predominated although they are well scattered throughout the city. There is, however, one place where many of the old homes of the aristocracy still remain. This is the

district that lies between Kropotkin Street and Arbat Street. Scattered amongst the big blocks of flats that were built at the beginning of the twentieth century there are many early nineteenth-century buildings that are typical "Nests of Gentlefolk." They are mostly small, timber buildings that are typical of the country mansions of the nobility with all their endless variety. The "Moscow Empire" style predominates with its columns, lion's heads over the windows, plaster garlands decorating the walls and the family coat of arms on the façade. The main entrances to these houses do not open on to the street but on to the yard where there are numerous subsidiary buildings. Behind the houses there are gardens with beautiful old linden trees and sweet-smelling jasmine.

Amongst the mansions of Moscow's "Faubourg St. Germain" tiny churches with onion-shaped domes and tall belfries are dotted here and there.

The most noteworthy of the Moscow palaces is the Pashkov House on Mokhovaya (Moss) Street; it was built by the architect Bazhenov in the eighteenth century and is still one of the most beautiful buildings in the city; today it houses the public reading rooms of the Lenin Library. A somewhat later building but one that is just as pretentious is the Naidenov House on Chkalov Street. This building is one of the best built by the architect Gillardi: it has a beautifully designed series of huge rooms and a splendid park on the sloping bank of the Yauza River; the garden is decorated with summer houses and rotundas of the type beloved of the old Russian aristocracy. This building is now the Visokiye Gory (High Mountain) Sanatorium. Another interesting building is the low, squat mansion on Vorovsky Street which is now the headquarters of the Union of Soviet Writers. This is the house that Leo Tolstoy describes in his *War and Peace* as the Moscow mansion of the Rostov family.

Kuznetsky Most, the Blacksmith's Bridge, was a street that was prominent in the life of aristocratic Moscow. It is a narrow

street in the center of the city, not far to the north of Sverdlov Square where in the old days were to be found the fashion houses that were famous throughout Russia. On the Kuznetsky Most the Moscow aristocrats could buy everything they needed to make a grand showing at the balls held in the Hall of Columns of the Nobleman's Club, a building we have already seen as the House of the Trade Unions.

Kuznetsky Most was one of the busiest streets in old Moscow: up and down the street there was always a constant stream of shoppers and sightseers while elegant carriages with footmen on the box drove up to the various shops. In the Soviet period it has become the center of the book trade; it also has a number of art salons and some big shops.

The merchant class of old Moscow also had their own favorite sections of the city; notable amongst the merchant sections was Zamoskvorechye, that is the district across the river from the Kremlin.

The most notable thing about the life of the trading class is that they were completely cut off from all other classes in Russia. This insularity had its effect on Zamoskvorechye, giving it the air of a provincial town inside the capital, where we can still find traces of the merchants. There are large number of two-story buildings absolutely untreated architecturally; they have premises for shops and warehouses and long wooden fences shutting off gardens that were neglected except for the traditional gooseberry patches. The life within these "cupboard houses" was one of patriarchal mercantilism as portrayed in the plays of Ostrovsky.

The general aspect of Zamoskvorechye had begun to change before the Revolution when factories were built and large blocks of flats appeared. The greatest changes came during the Soviet period, however. Many of the streets were asphalted, new factories and blocks of dwelling houses were built, big bridges were thrown across the river, and the underground railway was carried through the district by a tunnel under the Moscow

River. The greatest change, however, is not external, but internal: as is the case throughout the USSR there are no more merchants, no class of big private tradesmen. The houses of the merchants now contain offices, public institutes, or are subdivided into flats for working people—factory and office workers and professional people.

Modern Zamoskvorechye has more scientific institutions than any other section of the city. There are scientific institutions everywhere, in the main streets and the side streets, but the biggest concentration is in the district around Greater Kaluga Street.

Greater Kaluga Street is one of the most completely reconstructed streets in Moscow. It is a wide street that stretches from October Square on the outer circular road, to the Lenin Hills; it runs parallel to the river and is separated from it by the slopes of a hill. This long street carries a large number of huge new dwelling houses that have been designed to form a single group; many people prominent in the scientific world live in these houses. In this district there are the Institute of Power Engineering, the Institute of Organic Chemistry, the Institute of Physical Problems, and many others. Among them, situated in the big park-like Neskuchny Gardens is the headquarters of the Academy of Sciences.

Now let us look at the industrial districts of Moscow; these are of great importance to the country for Moscow provides one-sixth of the total industrial output of the USSR. From the Belfry of Ivan the Great we saw the clouds of smoke hanging over the chimneys of the many factories on the outskirts of the city. Now let us pay a visit to some of them.

We could begin with the Krasnaya Presnya district in the western part of the city, where there are the huge buildings of the Three Hills (Trekhgornaya) Textile mills. In the eastern part of Moscow we could go to Zastava Ilyicha (formerly Rogozhskaya Zastava) near which there is the huge plant that produces high grade steels—the Hammer and Sickle Plant.

There are many other huge factories in Moscow—the big Fraser Tool Plant, a big group of electrical goods plants, the Ordjonikidze Machine-Tool plant and so on. We will, however, select a district that contains the greatest concentration of big industrial concerns that was almost completely rebuilt during the period of the Five-Year Plans; this is the district known as Leninskaya Sloboda in the extreme south-east of Moscow.

The underground will take us to the Sloboda in less than twenty minutes although it is right on the outskirts of the town. If we had any idea of what the outer suburbs of Moscow looked like before the Revolution we must prepare ourselves for a real shock as we leave the underground station building. The station, incidentally is called “Zavod imeni Stalina” which means the Stalin Plant. Where there were formerly rows of squat, dilapidated wooden huts huddling beside streets that were nothing but masses of sticky impassable mud, lit at night by smoky kerosene lamps on red posts, where the only form of entertainment was the tavern filled constantly with the raucous voices of drunken mechanics, there are now block after block of comfortable flats, asphalted streets, schools, nurseries, and a medical center. We see the new building of the factory club known here as the “Palace of Culture”; at the club there are regular concerts and theater shows, lectures, various club activities, a gymnasium and, the latest addition, an indoor swimming pool.

The nucleus of this industrial district with its new life is formed by the Soviet factories—the Stalin Plant, the Ball-Bearing Plant, the Dynamo Electrical Works and the Parastroi Boiler Works. All around us we see their fine new buildings of reinforced concrete and glass.

The Stalin Automobile Plant is one of the biggest motor works in the world. It grew up during the period covered by the Five-Year Plans on the basis of a small automobile workshop that before the revolution belonged to a capitalist named Ryabushinsky. The automobiles from this plant are to be found

in every part of the Soviet Union. The gray-green trucks with the "ZIS" trademark are to be found at every factory and on every collective farm. In every Soviet town you will also find the long black limousines with the ZIS trademark. During the war, when our thoughts were far from comfort of any sort the engineers of the Stalin Plant were busy designing a new and more comfortable limousine for post-war production.

Up to 1931 the site now occupied by the Ball-Bearing Plant was a rubbish dump. A year later the first shops of the plant began work. Like the Stalin Plant this is also one of the biggest plants of its kind in the world. The huge shops look like an exhibition of modern machine-tools.

We have seen how the people of Moscow live, work, and study, now let us see how they use their leisure time for recreation. We already know the chief theaters. There are many concert halls in Moscow as well as summer gardens, sports grounds, trade union clubs—you find them in all parts of the city.

In summer the city parks are the chief attraction. Apart from the boulevards and small district parks there are a number of big city parks or recreation grounds known in Russia as "Parks of Culture and Rest." The most popular is the Gorky Central Park in the south-western part of Moscow not far from the center of the city. The park was laid out on former waste ground on the banks of the Moscow River beside the Crimea Bridge. The bridge is one of the two points at which the outer, "Garden" Circle crosses the river. On the banks of the river there is an exhibition of the types of booty which the Red Army captured from the Germans during the war: there is everything there, from the big siege guns that shelled the houses and streets of Leningrad to ersatz winter boots made of straw. Beyond this exhibition stretch the avenues and installations of the park.

The first part of the park that we see is laid out like a French garden, absolutely straight avenues of trees, lawns, and flower

beds of regular shape, statues, stone vases of flowers, and big open spaces. Further on upstream where some old private gardens were included in the park it bears more resemblance to the English type of garden—trees with huge leafy crowns and their branches meeting to form arches over winding footpaths that suddenly change direction and disappear over the crown of a hill. The attractions offered by the park are many and varied: the labyrinth, the helter-skelter, scenic railways and cafés compete with lectures, exhibitions and reading rooms. In the evenings the park is always crowded with young people—the gravel of the path is crunched by thousands of feet, there are laughter and merry voices.

On the opposite side of the town and at the other end of the underground line that begins at Gorky Park there is a park of an entirely different type—Sokolniki. This is a forest with radial roads leading from a central hub where all the entertainments are massed together. This is the place where the tsars of old Russia went hunting with their falcons—the word “Sokolniki” means “falconers.” The city of Moscow grew constantly but Sokolniki has never been touched. In the midst of the noisy city there are huge pine trees hundreds of years old.

The next big park that we visit—at Izmailovo—is of the same type. This is the Stalin Park and it lies on the eastern outskirts of the city; it is also connected with the center by a new underground railway line. The Stalin Park at Izmailovo is a dense forest with untouched natural grass and a strong smell of pine trees.

On the northern edge of Moscow there is the Ostankino Park bordering on the Agricultural Exhibition which was a regular feature here before the war. This exhibition was splendidly equipped and contained a large number of pavilions filled with the produce of the collective and state farms of the USSR. In the future all this district will form part of the huge Botanical Gardens that are being laid out by the Academy of Sciences of the USSR.

A favorite trip on summer evenings is to the Lenin Hills by car, trolley-bus or river taxi. The Lenin Hills are part of a high moraine lying south-west of the city and cut in two by the river. If you go by road the rise from the center of the city is scarcely noticeable so that when you reach the hills and turn to look back the view of the city is as unexpected as it is beautiful. The splendid panorama of the huge city is a sight that charms stranger and Muscovite alike.

IV. AROUND MOSCOW

WE CAN see the country around Moscow from the windows of a suburban train, from an automobile following the main arterial highways or from the deck of a passenger steamer on the Moscow-Volga Canal.

The railways and the roads cut through the manufacturing districts on the outskirts of Moscow and emerge into typical central Russian landscape. The country is slightly undulating, birch, pine, and fir trees predominate, winding streams meander through green fields between rectangular ploughed fields. The eye does not take this in all at once; to sink deeply into the full silence of nature and lose all traces of the city one has to travel a good many miles.

There are many small towns and factory-housing estates around Moscow—Babushkin, Perovo, Liublino, Kuntsevo. Many of these are dormitory towns with a large percentage of the population working in the city: and others have grown up around big factories.

Around the outskirts of the city there are also many installations directly connected with the constantly growing city and its economy—pumping stations, filter beds, sewage disposal stations, the marshaling yards of the different railways, etc.

Between these various municipal installations we see truck gardens and glasshouses. The bigger of them belong to the suburban collective and state farms which send their produce

to Moscow by road. Lying between the farms there are smaller plots of well-tilled soil, the allotment gardens of the Muscovites. Allotment gardening developed on a grand scale in all Soviet towns during the war: the state helps the allotment holders, the land is rent-free, in many places the gardens are plowed by tractor, seed is provided, and government consultants are available. In the places that are within easy reach of the city every available inch of land has been plowed up: on Sundays the suburban trains are packed with people carrying gardening tools. Mechanics, bookkeepers, typists, teachers, doctors, most of them people who had never tilled the soil before, are now getting good harvests from their gardens.

Groups of summer cottages, or *dachas*, have strung out along all the suburban railways. They are log-built cottages, mostly with glazed balconies and little gardens with flowerbeds and vegetable patches. Many Moscow people spend the summer months in these cottages while some of them are inhabited all the year round, their owners traveling to Moscow every day to work.

The old palaces around Moscow are worthy of a visit. There are many of them quite near the city—Kuskovo, Kuzminki, Ostankino, Uzkoye, and others. Some of these old palaces have great historical associations—Russian poets and writers lived in them and immortalized the localities in their works.

Take Arkhangelskoye, to the west of Moscow, for example. Pushkin was at this palace several times, and he mentions it in his poems. In general style it is a miniature Versailles but it has many features that belong only to suburban Moscow.

A straight wide road out through thick forest leads to the elegant white palace with its luxuriously furnished apartments and its little tower. To reach the palace we pass through a *cour d'honneur* bordered with outbuildings and colonnades. Behind the palace there is a gentle slope down to the Moscow River; the slope is beautifully laid out with terraces, lawns, grottos, statues, and stone vases. From here one has a splendid panoramic

view of the river valley framed in woods. Not far from the palace is the family theater with some beautiful decorations.

The Arkhangel'skoye Palace itself is a museum today while the other buildings have been fitted out as a sanatorium. This is true of all the Moscow suburban palaces—they are museums or sanatoria or rest homes for the Moscow workers or summer colonies for Moscow children.

There are quite a number of historical monuments around Moscow. The village of Kolomenskoye is situated on the Moscow River at a short distance southeast of the city. The huge sixteenth-century stone church at Kolomenskoye is a fine example of Russian architecture. Berlioz, the famous French composer wrote that he had seen nothing more beautiful or magnificent in the world than the Kolomenskoye church. An architectural museum has been opened in the village of Kolomenskoye where we may see log-built churches brought from the northern forests, miracles of the old Russian timber architecture which knew neither saw nor nails but produced buildings of astonishing beauty.

Many of the monasteries near Moscow also date back to the times of ancient Rus. There is a belt of these monasteries and convents around the city—all of them with thick fortress walls and defensive bastions—the New Maiden Convent the Don, Daniil, Simon, and other monasteries. The Troitse-Sergiev Abbey (Sergei's Abbey of the Trinity) in Zagorsk, to the north of Moscow, is one of the most famous of the more distant monasteries. It was both a monastery and a citadel and gained great fame during the war against the Polish intervention at the beginning of the seventeenth century when it withstood a long and bitter siege; some of the work of Andrei Rublev, monk and icon painter who was one of Europe's greatest artists in the fifteenth century, is preserved in this abbey.

At Istra to the west of Moscow we find the old and well-known New Jerusalem Monastery, a monument of great architectural and historical importance which was barbarously de-

stroyed by the Germans when they were in this region in 1941.

As we travel farther from Moscow all traces of the "urban" are lost. Forest, fields, more forests. . . .

V. THE USSR VIEWED FROM MOSCOW ONE-SIXTH OF THE WORLD

WE LEAVE the capital and make our way further into the interior of the country. Before we visit the various regions of the country let us take a look at the map of the country as a whole. It is true this will take up some time but it is time well spent. If we get to know the country as a whole to start with we shall be better able to understand separate regions as we visit them.

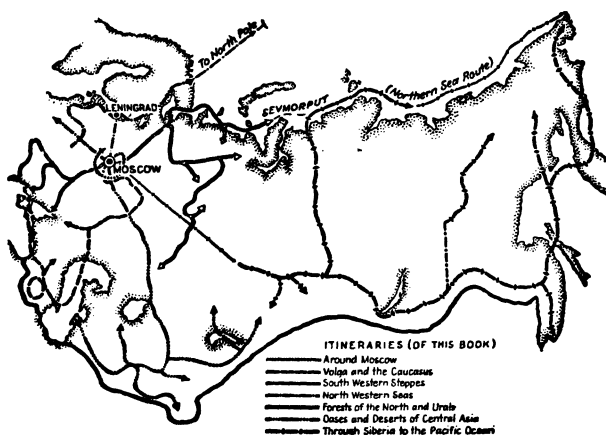
USSR

Area—8,450,000 sq. miles

Population (1940)—193,000,000.

Before us lies the map of the USSR. A cluster of slowly diverging meridians cut at regular intervals by curved parallels, the tortuous contours of the coast, dotted lines marking frontiers, winding rivers, black rings marking towns. A tremendous country. The map of the USSR is like the map of a whole continent: the world consists of six continents and the USSR is one-sixth of the whole land surface of the globe. The Soviet Union occupies the eastern half of Europe and the northern third of Asia. The maximum distance from north to south is over 3,000 miles and from east to west, it is almost 6,000 miles which is roughly the distance from the pole to the equator or from New York to Patagonia. In summer the sun is always shining on the territory of the USSR; when twilight falls in the west the sun is already rising in the east. Three oceans form a frame round the map of the USSR—the Pacific in the east, the Arctic in the north, and the Atlantic (through its seas, the Azov, Baltic, and Black Seas) in the west. The total length of

the Soviet Union's frontiers is over 38,000 miles or more than twice round the equator. A dozen foreign states have common borders with the USSR, countries as remotely situated from each other as Finland and Afghanistan, Czechoslovakia and China. The territory of the Soviet Union is big enough to hold three U.S.A.'s, ninety Great Britains or seven hundred Bel-



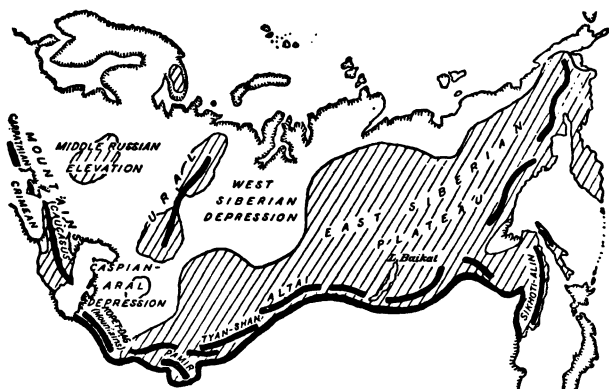
giums. The area of the Soviet Union is greater than that of the side of the moon which faces the earth.

The first idea that comes to mind when one looks at the map is that a country of such size must naturally offer a great variety of scene. It would be difficult to find another country in the world with a more variegated landscape than that of the Soviet Union. As we make our mental journeys from Moscow to the distant parts of the country we shall constantly be encountering new and unusual geographical features.

The map that lies before us depicts an astonishing variety of everything that goes to make up nature—topography, climate, soil, and vegetation. We shall have to cross some of the greatest plains in the world and penetrate deeply into some of

the highest mountain ranges. The western and more densely populated part of the Soviet Union is mostly a low-lying plain while the eastern part, less densely populated, includes many huge mountain ranges.

As far as topography is concerned the Soviet Union is like the mirror image of the U.S.A.: the U.S.A. also has regions that are predominantly plains or predominantly mountains but they



are located geographically in positions the reverse of those of the Soviet Union.

As we have said the western part of the Soviet Union is in general a plain or rather a series of plains differing greatly in character. The western plain is divided into two parts by the Ural mountains which run almost due north and south: west of the Urals lies the East European Plain, hilly and undulating while to the east—the West Siberian Plain is ideally flat and smooth. In the south of the USSR the plains merge into a long chain of high mountain ranges which run along the whole of our southern frontier. This belt of mountains includes the Carpathians, the Crimean Mountains, the Caucasus, the Kopet Dag, the Pamirs, the Tien-Shan, and the Altai. Mount Elbrus

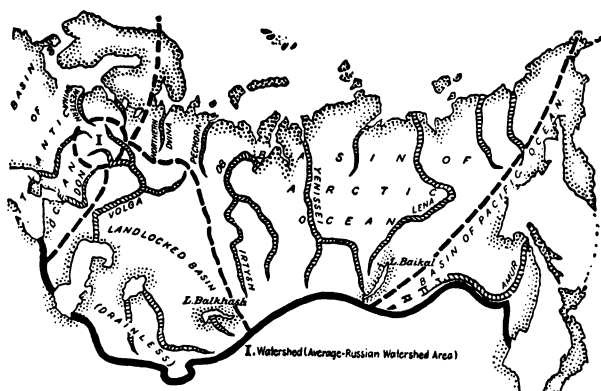
in the Caucasus has a height of over 10,000 feet, Khan Tengri in the Tien-Shan has a height of about 23,000 feet and Peak Stalin in the Pamirs, the highest point in the USSR, has a height of some 24,000 feet. It is interesting to note that there are some huge depressions in the vicinity of this belt of high mountains: the Caspian Sea between the Caucasus and Central Asia is 80 feet below normal sea level and has a depth of well over 3,000 feet; near the eastern shores of the Caspian there is the huge depression left by the dried-out Lake Batyr (Karagiz) which reaches 433 feet below sea level.

The eastern half of the USSR consists almost entirely of highlands which include chains of mountains and plateaux although few of them reach the eternal snowline. The only great heights in the far eastern part of the USSR are the mountains of Kamchatka amongst which are the largest active volcanoes of the Old World. The biggest of these volcanoes is Kliuchevskaya which reaches a height of 15,950 feet.

The USSR has a greater length of waterways than any other country in the world and the power potential of these rivers, estimated at 280,000,000 kilowatts is also the world's biggest; many of the Soviet rivers are of great length and volume. The river network, as we can see from the map, has certain peculiar features: the rivers of the East European Plain, the Volga, Dnieper, Western Dvina, Don and Northern Dvina, have their sources in the center of the plain and flow toward different seas. Their upper reaches are all close together so that they are easily connected by means of canals. The most important rivers of Siberia, the Ob, Yenissei, and Lena run parallel to each other in a south to north direction across the whole of Siberia; in the Far East the Amur flows into the Pacific while the rivers of Central Asia do not reach any open sea, they either fall into inland lakes or disappear in the desert.

There are many lakes in the USSR amongst them the world's biggest, the Caspian Sea, and the world's deepest fresh-water lake, Lake Baikal, which has a depth of 5,710 feet.

During our trips around the Soviet Union we shall visit many rivers and lakes and shall learn something of their history: we shall learn to distinguish between the lakes of the northwest that were the outcome of the last ice age, those of Central Asia that are the remains of bigger dried-up expanses of water and the mountain lakes that have been formed by landslides or movements of the earth's crust that blocked the path of mountain rivers.



Our journeys will take us into various climatic zones of great contrast. The USSR is such an extensive territory and the distance from north to south is so great that when the temperature of the extreme north during the long arctic night falls as low as 70° below zero Centigrade it is still possible to walk along the shores of the ice-free seas of the south in the shade of evergreen palms. While one traveler is blundering along in a thick gray mist formed of myriads of tiny particles of water as often happens in the vicinity of the Pacific, another traveler is suffering intolerable thirst in the waterless deserts of Central Asia where there is not a single cloud in the sky for weeks on end.

Despite all these great extremes the general climate of the country may be described as temperate and continental.

A very large territory of the Union has cold frosty winters and comparatively hot summers; the extremes of summer and winter temperature increase the farther we get from the Atlantic Ocean, that is moving from west to east. In Leningrad the winters are quite mild and the summers are not too hot while in Siberia the world's heaviest frosts are experienced in winter and over a considerable territory the summers are so hot that not only grain and vegetables ripen but even melons grow to maturity.

As we journey farther inland, the continental nature of the climate becomes more pronounced and the country becomes drier. On the shores of the Baltic vegetation is more likely to suffer from an over-abundance of moisture than from drought; in the Transvolga Region, Kazakhstan, and Central Asia farming is made difficult by a shortage of moisture and constant struggle has to be waged against droughts.

The climate of the Soviet Union as a whole is more severe than that of Western Europe but, with the exception of a small part of the extreme north, it is far from that Hyperborean severity which is reputed to it.

The southern regions of the country differ somewhat from the general picture as they are protected from the north by high ranges of mountains. The southern littoral or the Crimea, the valleys of the Transcaucasus, and some odd corners of Central Asia have no winter at all—these regions form the Soviet subtropics. One of these regions has a very high rainfall (Batumi on the Black Sea Coast has the highest rainfall in the USSR, over 100 inches per annum), while others are extremely dry although they all have one thing in common—their average temperature is above zero even in the coldest months.

The climate of the Far Eastern territory of the USSR also stands out against this general background. The maritime region lies within the monsoon zone: the frosty and almost snowless

"Siberian" winter is followed by a warm, rainy, "Leningrad" summer.

GEOGRAPHICAL "RECORDS"

Northernmost point on USSR mainland—Cape Chelyuskin, 77°43' N. Lat.

Northernmost island in USSR is Rudolph in Franz Joseph archipelago. North Cape on Rudolph Island—81°51' N. Lat.

Southernmost point in USSR is village of Childuhtar near Kushka, Turkmenian S.S.R. on borders of Afghanistan—25°38' N. Lat.

Easternmost point on USSR mainland—Cape Dezhnev on Chukotka Peninsula, 169°39' W. Long. East of Cape Dezhnev is the Soviet Island Ratmanov belonging to the Diomide Group in the Behring Straits, 169°06' W. Long.

Deepest known point in the waters of the USSR is north of Wrangel Island in the Arctic Ocean—17,844 feet. Papanin's North Pole expedition found a depth of 14,326 feet.

The highest tides in the USSR are on the Gizhiga and Penzhina shores of the Okhotsk Sea—36 feet.

The deepest dry depression in the USSR is the Batyr (Karagiz) in the Kazakh S.S.R. 5 miles east of the Caspian—433 feet below sea level.

The highest point in the USSR is Mount Stalin in the Academy of Sciences Range 24,584 feet.

The biggest valley glacier in the USSR (and in the world) is the Fedchenko Glacier in the Pamirs—almost 50 miles long. Almost as long is the Southern Inylchek Glacier in the Tien-Shan.

Highest volcano in USSR—Kliuchevskaya in Kamchatka, 15,950 feet. In 1945 it was still active. The absolute height of this volcano (i.e. from foot to peak) is greater than that of any other in the world.

Highest inhabited point in the USSR is the meteorological station on Mount Elbrus situated at 13,940 feet; the station on the Glacier in the Pamirs is 13,776 feet above sea level.

The biggest lake in the USSR (and in the world) is the Caspian Sea with an area of 169,381 sq. miles.

The deepest lake in the USSR (and in the world) is Lake Baikal in Siberia, 5,711 feet.

The longest river in the USSR is the Ob and its tributary the Irtysh in Siberia—3250 miles.

The coldest spot in the USSR (and in the world) is North-Eastern Yakutia in East Siberia where lowest recorded temperature is 69.8° C. Average January temperature 50.5° C. It has recently been discovered that the average temperature in the village of Oimekon (on the River Indigirka) is even lower.

The highest rainfall in the USSR is at Batumi in Western Georgia—98 inches.

The lowest rainfall in the USSR is at Nukus on the lower reaches of the Amu Darya in Central Asia—less than 3 inches and in the Eastern Pamirs 2.4 inches.

The highest average temperature in January is at Batumi 6.1° C.

The highest summer temperature is at Termez, Uzbek S.S.R. in Central Asia where it reaches 50° C. in the shade at 1 o'clock.

The USSR occupies first place in the world for the following:
territory—8,450,000 sq. miles.

length of rivers—250,000 miles.

potential energy of rivers—280,000,000 kilowatts.

area of coniferous forests (total forest area of USSR) 1,750,000,000 acres.

area of black earth—625,000,000 acres.

surveyed mineral resources (in 1938):

petroleum—8,640,000,000 tons.

iron ore—267,000,000,000 tons (including ferrous quartz).

peat—151,000,000,000 tons

manganese ore—785,000,000 tons.

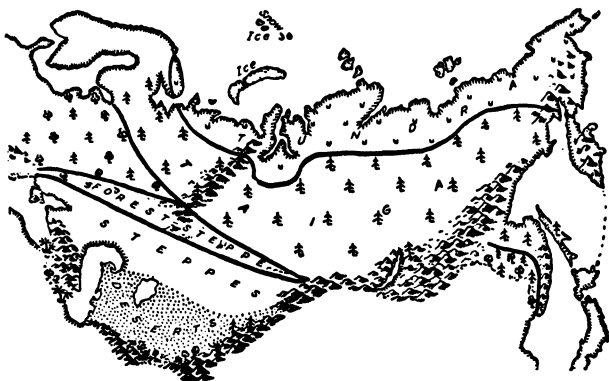
apatite—2,000,000,000 tons.

potassium salts (largest deposit at Solikamsk in North Urals—18,400,000,000 tons of potassium oxide).

The great distance covered by the USSR from north to south includes many different soil and vegetation zones, from tundras

to subtropics. This produces landscapes of great variety, all of which we shall visit. As we leave Moscow in different directions we shall meet with many different types of vegetation.

Moscow itself lies in a mixed forest region with podzol soil where fir and pine are interspersed with oak, linden, maple, birch, and ash. This mixed forest region occupies a triangle in the middle of the European part of the USSR: its three angles are approximately Leningrad, Ufa (South Urals), and Lvov.



North of the mixed forest belt lies the endless taiga, the conifer belt which stretches right across the USSR from west to east: in the west the trees are mostly fir and pine and in the east they are mainly larch and silver fir; everywhere there are some birches amongst the conifers. The Soviet conifer forests are the most extensive in the world. In this zone the soil is also podzol.

In the extreme north the forests deteriorate to tundra which form a strip along the whole coast of the Arctic Ocean. The swampy peat soil of the tundra has a permanently frozen subsoil where nothing grows but moss and lichens and some berries, mostly on bushes with very few stunted trees.

South of Moscow there is a change from forest to steppe

where trees grow in small islands in the huge black-earth fields. Beyond this belt comes the open steppe where there are practically no trees of any kind; the majority of the steppe (in the west, the entire steppe) has been brought under the plow. In the European part of the USSR the steppes reach right down to the Black Sea and Stalingrad while in Western Siberia they form a huge wedge south of the Tran-Siberian railway which itself passes through the wooded steppe belt.

The steppes are famous for their fertile black earth (*chernozem*). The USSR has a larger area of *chernozem* than any other country in the world.

Farther south, where the temperatures are higher and the moisture is less the steppe gradually develops into semi-desert with chestnut and brown soils and then becomes pure desert with huge areas of sand and salified soil. There is some strange vegetation in the desert zone which in general occupies less territory than the bare earth. The deserts lie mainly east of the Caspian, in Central Asia and Kazakhstan. Where rivers flow from the mountains into the desert there are fertile, irrigated oases. The gray earth soils, rich in lime, are very fertile when artificially irrigated. Alternating sun-burned deserts and fertile green oases are the characteristic features of the landscape of the Central Asian plains.

As we have already said, there are some corners of the USSR in the extreme south that are protected from the north by high mountain ranges and which have hardly any winter. These places are all rich in vegetation, mostly evergreen.

The land surface of the USSR, therefore, is variegated and colorful: the treeless gray expanses of moss in the tundras, treeless dry expanses of sand and wormwood in the desert, the primeval conifer forests of the taiga, and the impenetrable jungles of the subtropics, expanses of fertile black earth in the steppe, and high mountains piled up with barren stones and ice.

The same variety applies to the animal kingdom, there is

everything from the polar bear to the tiger, from the arctic owl to the southern flamingo.

This is the series of pictures that we shall see in our travels.

Friendship of the Peoples

As we leave Moscow for various parts of the Soviet Union we shall nearly always be visiting regions of the country that are inhabited by different nationalities. We shall hear different languages spoken, the people will wear different costumes, and the buildings in town and country will be of different architecture. The Soviet people, though of over a hundred different nationalities, are one great nation united by firm friendship.

According to 1940 figures there were 193 million people living in the Soviet Union which gives the country a population that is third in the world and is exceeded only by that of India and China. Slightly more than half of this population consists of Russians. The Russians are spread over most of the territory of the USSR although they are concentrated in the central parts of the country. To the southwest live the Ukrainians who take second place numerically and to the west are the Byelorussians who occupy third place. In the Caucasus there are the Georgians, Azerbaijanians and Armenians, in Central Asia and Kazakhstan the Uzbeks, Turkomens, Tajiks, Kirghiz and Kazakhs, in the northwest, the Karelians and Finns, in the Baltic republics, the Lithuanians, Letts, and Esthonians, and in the extreme southwest, the Moldavians. There are also Tatars, Jews, Bashkirs, Chuvash, Yakuts, Ossetians, Kabardinians, Evenks (Tungus), Luoravetlans (Chukchi), Yuits (Eskimos), and many others.

Before the 1917 Revolution the Russians were the only people in the country enjoying full citizenship. All other peoples had their rights curtailed in some way or another. The revolution, effected under the leadership of Lenin and Stalin, gave full rights to all the peoples of the country.

The various nations make up the sixteen constituent repub-

lics which entered into voluntary union to form the Union of Soviet Socialist Republics, a federal state. The federal authorities decide question of war and peace, the representation of the Union in international relations, the leadership of the armed forces of the USSR, the instrumentation of a single economic plan, and so on. Apart from these points that are recorded in detail in the Constitution of the Union, each of the republics enjoys independent statehood. Every constituent republic is a sovereign state with its own Supreme Soviet (parliament), its own constitution, its own national army; each constituent republic has the right to enter into relations with other countries and to participate in international organizations and conferences. The constituent republics have the right to secede from the USSR.

Some of the constituent republics of the USSR are inhabited by a number of nationalities; this is especially true of the Russian Federative Republic. Within the constituent republic the national minorities are granted varying degrees of autonomy—autonomous republics, autonomous regions, and autonomous areas.

The following are the constituent republics of the Union: the Russian Soviet Federative Socialist Republic (R.S.F.S.R.), the Ukrainian Soviet Socialist Republic (S.S.R.), the Byelorussian S.S.R., the Azerbaijan S.S.R., the Georgian S.S.R., the Armenian S.S.R., the Turkmenian S.S.R., the Uzbek S.S.R., the Tajik S.S.R., the Kazakh S.S.R., the Kirghiz S.S.R., the Karelian-Finnish S.S.R., the Moldavian S.S.R., the Lithuanian S.S.R., the Latvian S.S.R., and the Esthonian S.S.R. In the course of our travels we shall visit each of these republics.

The friendship existing between the peoples of the USSR was seen to its greatest advantage during the war against fascist Germany. This friendship, this moral and political unity, played an important part toward ensuring victory for the USSR. The war with Germany was the supreme test of durability and the USSR came through with flying colors.

At the time of tsarist Russia many of the peoples of the country were not allowed to serve in the army and take up arms in defence of their country for the government of the tsars did not trust them. Every one of the liberated peoples, however, took part in the struggle for the revolutionary reconstruction of the country, they all fought against the enemies of the Soviet Union and against the attack of the Hitlerites. The Red Army is a multi-national army. Russians and Ukrainians, Armenians and Georgians, Tatars and Kirghiz fought side by side. In the lists of soldiers who were awarded the title of Hero of the Soviet Union, the highest honor in the country, there are representatives of all nationalities. Kazakhs stood to the death in defence of Moscow, Azerbaijanians helped drive the Germans out of the republic of the Byelorussians, Russians spilt their blood to liberate the Ukraine. All realize that only the integrity of the USSR guarantees to each of the nations its political independence, its economic and cultural prosperity.

The peoples of the Soviet Union fought side by side on the home front as well as in the army. Every republic of the USSR became an arsenal supplying the needs of the Red Army. Munitions came from the R.S.F.S.R. and Uzbekistan, from Turkmenia and Georgia. War factories were built everywhere, in all republics the workers and peasants bent all their efforts to provide more food, more weapons and more raw materials. At the head of this enthusiasm of all the peoples stood the Russians, first among equals.

As we make our journey through the Soviet Union we shall see that the territory is settled very irregularly. The population is densest in the southwestern and central regions where in some parts it exceeds one hundred to the square mile; the population is also fairly dense in the valleys of the Caucasus and in the industrial regions of the Urals.

The most densely populated part of Siberia is the strip on either side of the Trans-Siberian Railway. North of this strip, in the taiga zones, the population gets thinner and is still more

sparse as one goes farther north. In Central Asia where there is a population as dense as one hundred to the square mile *around some of the oases there are stretches of desert land and mountains with less than one person to the square mile.*

Ever since the establishment of Soviet power the density of the population in the eastern regions has been constantly increasing on account of the large numbers of industrial concerns that have been built.

We shall see many new cities and still more old cities that have developed rapidly during the last few years. This all speaks of a growth of industry. The old conception of the USSR as a land of villages is no longer a true one. The urban population of the country has grown tremendously: the last pre-war census showed that one-third of the population of the USSR are town-dwellers; in 1926 one-sixth lived in towns while in 1897 only one-eighth of the population were town-dwellers. The agricultural population lives mostly in villages: isolated hamlets or single farms are a rarity in the USSR. There have been many changes in the USSR during the past few years—industrial enterprises, power stations, secondary schools, hospitals, clubs, and theaters appeared in the villages. In the big villages which one finds mostly in the southern regions of the USSR (the northern villages are smaller) there are as many inhabitants and as many cultural institutions as there are in many of the towns.

The New Geography

One of the distinguishing features of the Soviet Union is the great variety of landscape. The great differences in the nature of the country determine the economic differences of various regions—in one place coal is extracted, in another aluminum is smelted; here flax is sown, there cotton; the sable is hunted and trapped in one region, fishing is the chief industry of another.

Economic differences, however, are historical as well as geographical. Before the Revolution economic development was

very irregular. Now that the means of production are no longer private property the whole economy of the country is developing in accordance with a single economic plan. Nevertheless, as we shall see, traces of the old irregular development still remain.

We have already drawn attention to the dense population around Moscow, the large number of towns and the extensive network of railways; industry in this central region is well developed, factories are to be seen everywhere, many of them old, pre-revolutionary factories that have been very considerably reconstructed. This is an old industrial region that developed many years ago.

In the east, beyond the Urals, there are also many factories but they are farther apart and between them there are great stretches of virgin soil with considerable untouched mineral wealth. These are all new factories that have been built very recently. This new industrial region began its development in comparatively recent times but it is growing at a greater pace than the old industrial districts and is already overtaking them. There are also regions, the Far North, for example, that are only just coming into their own; their economic development is still in the embryonic stage.

This transformation of the country which we see at every step is due to rapid industrial development. Tsarist Russia was a backward agrarian land that was technically and economically dependent on foreign countries. The Five-Year Plans, instituted and instrumented under the guidance of Stalin brought the changes that made the USSR an industrial power. When the Second World War began the Soviet Union's industrial output was twelve times that of pre-revolutionary Russia. The USSR had a bigger total industrial output than Great Britain, France, Germany, or any other country in Europe although the output per head of the population was still less than in many countries.

The economic geography of the USSR, therefore, is based on this rapid industrial development. Before we begin our journeys

let us look at the economic map of the country in general in the same way as we have briefly reviewed its physical geography and ethnic composition.

The USSR and tsarist Russia . . . At first glance the maps are similar—the same seas, mountains, and rivers. The economic features, however, differ greatly. On the map of the USSR there are many new towns; the conventional signs for mines, ports, and factories are more numerous; the railway network is denser and there are new canals; a large-scale map will show us features that did not exist at all before—state farms, machine and tractor stations, hydro-electric power stations, and polar stations.

The largest-scale map, however, will not show us all the changes that have taken place. Take the towns, for example. The town is just a dot on the map and we cannot say how many factories, workshops, grain elevators, schools and colleges, or theaters it contains. Every Soviet town underwent considerable change during the period of the Five-Year Plans. Many of them grew (at least in population) to several times their former size: for example, Alma Ata in Kazakhstan—five times, Stalino in the Donetz Basin, six times and Murmansk on the Kola Peninsula, thirteen times their former size. In 1914 there were seventy-one towns in Russia with a population exceeding 50,000; at the beginning of the war there were about two hundred towns of this size in the USSR. The economic importance of the towns has increased to an even greater extent than their populations. As we have said the total output of Soviet industry is more than twelve times that of old Russia and industrial goods come mainly from the towns.

Another interesting change is in the railways: there are many new lines on the Soviet map that you will not find on the old one—Moscow-Donetz Basin, Turksib (linking Central Asia and Siberia), Petropavlovsk-Balkhash (from the Siberian railway to the center of Kazakhstan) and many others. These new lines have added about fifty per cent to the length of the Soviet railways. On the outbreak of war the goods traffic carried by

the railways was five times more than that of old Russia. The locomotives now in use are much more powerful than the old ones, they pull heavier trains at greater speeds. The USSR has one of the biggest railway networks in the world and its economic role is of great significance.

If we pick up an old illustrated magazine, or some picture postcards from tsarist times or study the pictures on the walls of our galleries and museums we shall see the same landscapes but with what a difference. The fields which we see today are plowed in long furrows stretching to the horizon and the old hedges and boundaries which cut up the fields into tiny plots have all disappeared; the fields of old Russia looked like patchwork quilts. In those days there were no tractors or combines; ill-fed horses pulled the tiny plows used by the peasants. There were no automobiles on the country roads and the pylons carrying the power transmission wires had not yet been erected. Occasionally one saw factory chimneys far away in the distance.

The towns of tsarist Russia also differed greatly from the present Soviet towns. There were few big buildings, few asphalted streets and in place of motor buses, trolley buses and electric trams there were the old one-horse droshkies and the horse trams. In the center of every town there were huge inns, a market place, the office buildings of the local authorities, the big private houses of the merchants, nobility, and higher officials. The policemen dozed in their striped sentry-boxes. Wherever there were factories they were surrounded by the hovels or barrack-like buildings for the workers who came from the villages "for the season."

What is the essence of this new geography which we may learn from the map, from statistics, and from views of the countryside? First and foremost, as we have already said, it is the geography of industry.

The industries formerly concentrated around Moscow and St. Petersburg produced about a half of the total industrial output of the country. In these regions there were textile mills,

engineering and chemical plants. About a quarter of the country's industrial production came from the iron and coal regions of the Ukraine (the Donetz Basin) and from the Urals. These two regions produced mainly raw materials—metal and coal—for the engineering industries. The maps of Siberia, Central Asia, and the north were almost clean sheets on which only single isolated factories were marked. Even mines were a rarity in those parts. The oil wells of the Caucasus, the lead mines of the Altai, and the goldfields of Siberia were tiny islands. Central Asia accounted for only two per cent of the country's industrial output. Kazakhstan and Western Siberia accounted for another half per cent.

This lopsided development is being overcome in the USSR and the differences between the center and the provinces are being abolished. Every year further progress is made in developing the economy of the provinces, primarily their industries, in order to bring them up level with the central regions.

The planned socialist economy of the Soviet Union prevents any sort of competition or antagonism between the various industrial regions. In old Russia the merchants of the center who sold Moscow cloth, Tula samovars, St. Petersburg haberdashery in the provinces were not interested in developing local industries in Central Asia, Siberia, and the Caucasus: such industries would only have robbed them of a profitable market. There was fierce competition between the iron and steel concerns of the Urals and the Ukraine. This competition had reached such a pitch before the revolution that many of the Urals plants had to close down. The industrial regions of the USSR all work together within the framework of a single economic plan, they do not combat but help each other. The old industrial centers that gained considerable experience in the past send skilled workers, machines, and equipment to the former backward regions to help build up their industries and effect their economic progress. In the early days of industrialization many factories were carted lock, stock, and barrel to the outlying

provinces. Every year more and more capital investments are made in the once backward districts. In the first Five-Year Plan period, for example, industrial capital in Central Asia increased 277 per cent, in the Urals and Siberia, 285 per cent, while that of the old industrial center increased only 87 per cent. The result of this is that there are no longer any backward, purely agrarian regions, in the USSR; every republic, every region has developed its own factories and power stations.

This task was made easier on account of the fact that outlying regions of the country proved rich in natural resources that were little studied or completely unknown in pre-revolutionary days. The systematic study of the country in Soviet times has provided a real base for the development of untouched regions. Kazakhstan opened up its treasure-house to provide gold, copper, lead, chromium, zinc, and other non-ferrous and rare metals, coal, oil, phosphorite, and various mineral salts. The whole region between the Volga and the Urals was found to contain oil. One of the largest deposits of phosphorites in the world was found in the Khibinsk Tundra on Kola Peninsula. Pechora, also in the Far North, took its place in the country's economy as a coal provider. The surveyed mineral wealth of the Urals is much greater than was formerly believed. The magnetic needle enabled geologists to find one of the world's richest iron ore deposits near Kursk. The new ores of the Altai, the mineral riches of the Kara Kum desert, the salts of Kara-Bogaz-Gol, (on the Caspian Sea), the mineral fertilizers of Armenia, the bauxites of Tikhvin near Leningrad—it would be difficult to list everything that has been discovered by the geologists, and developed by the industries of regions that were once called "poor." The rivers of the Caucasus, Karelia, and Siberia proved valuable sources of hydro-electric power.

The former remote provinces with their oppressed peoples developed rapidly after the Revolution mainly on account of the fact that their inhabitants have become equal participants in the work of building up the state and its economy. Uzbeks,

Yakuts, Kazakhs, Tatars, Buryats, Turkomens and dozens of other nationalities have built up their own states within the USSR in the form of constituent or autonomous socialist republics. Soviet power has awakened great forces amongst all these peoples who have produced talented statesmen, scientists, engineers, agronomists, and builders. Now that they have full right to an active political and cultural life all the former backward peoples of the USSR are themselves developing economy and reconstructing every corner of the country.

This reconstruction of the country has removed lines from the map that once marked the limits of human endeavour. Take the "northern limits of agriculture," for example, which once cut off almost half the country. North of St. Petersburg or Vol-goda planted fields were rare and their harvests poor. The whole of Northern Siberia, Yakutia, and Kamchatka lay beyond this line. The line has gone and agriculture to some degree or another has advanced to the Far North. There were the impassable swamps of Byelorussia and Lithuania—today they are being drained. Land that had once been abandoned has now been dried out, plowed and sown. The contours of the deserts have changed: irrigation works are reclaiming the desert mile by mile. The "impassable" ice of the Arctic has been cut through to form the Northern Sea Route.

Modern machines are helping the people who are busy transforming the face of the land. Aircraft carry workers and specialists, equipment and food to former unreachable corners of the distant tundra and to the center of the desert. Radio keeps Moscow in contact with the polar stations. High up in the Pamirs—"the Roof of the World"—there are motor roads. The White Sea and Baltic Canal, well equipped with its locks and ports has been cut through unpopulated regions of forests and lakes. Electric locomotives pull heavy trains through the mountains of Georgia, the Arctic, and Siberia.

Modern technology enables man to find and exploit the wealth of the country and to remake its geography by leaps and

bounds and not by tiny steps. New economic centers that change the face of the country are built up at once in their modern form. In the Khibiny Tundra beyond the Arctic Circle a whole combine of industrial enterprises—mines and refineries—has been built up to work the apatite deposits; the need for electric power led to the building of a hydro-electric power station on the near-by tempestuous River Niva; the power provided by the Niva supplies an electric railway line with current. Modern technology has penetrated as far as this desolate region where electric trains and reindeer sleighs run side by side.

In the steppes and deserts of Eastern Kazakhstan the Turksib railway has taken the place of camel caravans. The railway opened up many deposits of complex ores and rare metals. Tungsten, molybdenum, vanadium, cobalt, iridium, and indium are all mined in Kazakhstan. The new industrial centers needed fresh vegetables, milk and fruits; suburban truck gardening by state farms replaced the deserts. The railway gave rise to the need for new agricultural oases and at the same time provided the means to establish them. The fertile foothills of that part of the Ala Tau Range that lies beyond the Ili River are skirted by the Turksib Railway and came to life after the railway was built to provide a means of transport for their fruits. In many of the towns of Kazakhstan there are now food packing, sugar refining, and engineering plants. The capital of Kazakhstan, Alma Ata, is now connected with the whole Soviet Union by the railway network and has changed beyond all recognition.

The same applies to the whole country—everywhere geographical contradictions have been overcome.

Industry has developed all over the country. Agriculture in the form of state and collective farms has developed in step with industry. Transport has improved and the districts have better communications with each other. Grain formerly meant the Ukraine, iron and coal meant Donetz Basin, machines and textiles were synonymous with the "industrial center." All regions have now become to some extent producers of grain and other

foodstuffs; coal, iron and steel now come from the Urals and the Kuznetsk Basin in Siberia and from many other regions; machines, textiles, chemicals and the produce of many other branches of industry come from all parts of the country which does not, however, in any way detract from geographical division of labor between regions—each has its own speciality when viewed from the standpoint of the Soviet Union as a whole. Branches of industry that are new to the country have been firmly established in the USSR—aluminum, automobile, aircraft and tractor production, and many more; many of these new industries have been built up in “empty” places.

Thus we see that the USSR was economically and strategically prepared for war. New industrial regions were built up in the east, new defence bases in the interior of the country. Hitler was sadly mistaken when he thought that by seizing the cornfields of the Ukraine, the mines of the Donetz Basin, and by putting the industries of Moscow and Leningrad out of action when the front approached close to these two cities he would deal a death-blow to Soviet economy. The evacuation of Soviet industries from the regions in the vicinity of the front to the interior of the country in the early months of the war was made possible by the whole peacetime development of the USSR; railway transport had developed sufficiently, the eastern regions were ready with their resources developed and the whole planned economy of the country was in a state of excellent organization to fulfill this new task. During the difficult period of 1941–42 when this evacuation was taking place and before the liberation of the enemy-occupied regions had begun, the Soviet Union was able to carry out the tremendous task of supplying the Red Army with munitions and food. The economic potential that had been built up with great foresight in the eastern regions provided everything necessary for the Red Army.

The new geography of the USSR that had been created in days of peace helped conquer fascist Germany.

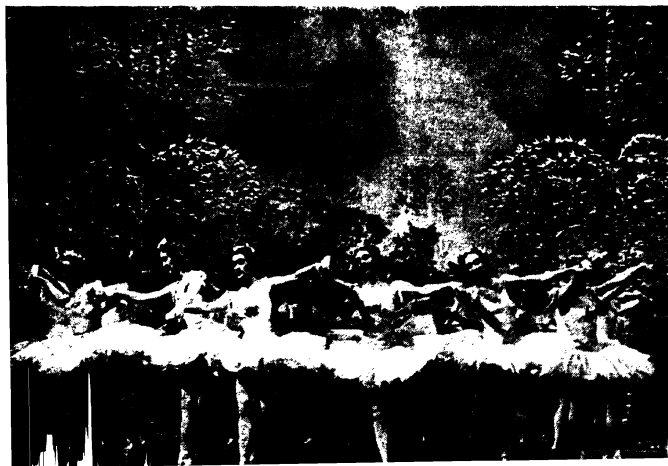
During the war new and tragic changes took place in the eco-

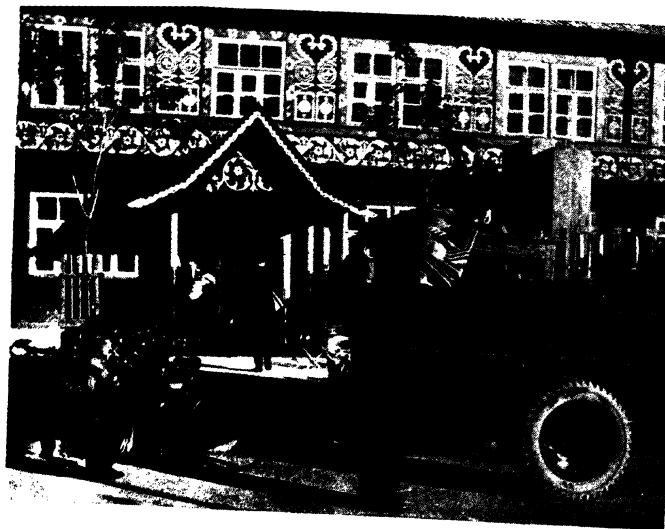


—AND AT PLAY

ABOVE:—A sports festival at the Dynamo Stadium.

BELOW:—Waltz from Chaikovsky's "Nutcracker suite" at the Ballet Theatre.





OLD STYLE AND NEW

ABOVE:—A worker moves into his old-style new house in the suburbs.

BELOW:—Gorky Street in Moscow. The Universal Shop (department store) is in the foreground.



conomic geography of the country: when the Germans were driven from Soviet territory by the Red Army they left a "desert zone" behind them. They wreaked terrible damage in the Ukraine, Byelorussia, and other western regions of the USSR. It is sufficient to mention that one-third of the population of the Ukraine was left homeless, that half of the national wealth of Byelorussia was destroyed, factories were blown up, mines flooded and houses burned.

Immediately after the Germans had been driven out of the USSR the work of restoration began. New towns are being planned, new factory buildings are arising from the ruins. The labor of the people, the heroism displayed in this work of reconstruction is to be equaled only by that of the Red Army during the war. The rehabilitation of the country is going ahead at full speed but the destruction was so terrible that there is still much to be done. Our travels will also take us through these war ravaged regions.

As soon as the war with Germany and Japan was over work on the compilation of a new Five-Year Plan for the rehabilitation and development of the national economy in 1946-50 was begun. This plan provides for the development of all branches of economy to a level exceeding that of pre-war.

Power Centers

Power supply is the very heart of the national economy. Electricity drives machines in mine and factory, gives motive power to electric locomotives, trams, and trolleybuses. Coal is burned to provide heat and power. Petroleum leaves the wells and is pumped thousands of miles over pipe-lines, is refined and in the form of petrol and other combustibles provides fuel for automobiles, tractors, aircraft, and Diesel engines. The power supply system is to the national economy of a country what the blood vessels are to the human organism—life is impossible without them.

Power supply in pre-revolutionary Russia was poor and primi-

tive. Everything centered around the Donetz Basin where coal was extracted by hand; productivity was low so that the country experienced a constant fuel crisis. The locomotives that hauled coal over long distances to the industrial centers consumed about a quarter of their load in doing it. Coal was burnt wastefully in the fireboxes of antiquated boilers. Crude petroleum was often wastefully burnt as fuel.

In the USSR today there are many regions which provide the country with valuable fuel—the Donetz, Kuznetsk, Moscow, Karaganda, Pechora, and Urals are the main coal fields. Coal sufficient to supply the needs of large territories is extracted in Central Asia, the Transcaucasus, and in the Far East. In pre-war days the total output of coal had grown to four or five times that of pre-revolutionary days. Even when the Germans occupied the Donetz Basin they did not strike a death blow at Soviet industry: the other coal fields increased output to make up for the loss of the Donetz Basin. In many regions the use of such locally obtainable fuels as peat, combustible shale, natural gases, etc., was developed during the war.

The same thing applies to petroleum. In old Russia oil was extracted almost exclusively in the Caucasus. The Soviet Union now gets oil from a number of new fields in different parts of the country.

High voltage transmission lines have long since become part and parcel of the industrial landscapes of the USSR. They not only serve the areas in the immediate vicinity of the power stations but carry their current from districts that are rich in power resources to those that lack them.

Let us examine some of the more important fuel and power centers of the USSR.

The chief coal provider is the Donetz Basin, which lies in the eastern part of the Ukrainian S.S.R. and partly in Rostov Region of the R.S.F.S.R. Coal is mined in much larger quantities and by far more modern methods than in old Russia. Many new mines have been opened and the coal is cut by pneumatic drills

and cutting machines. The transport of coal from the workings to the surface is fully mechanized.

Before the war the Donetz Basin provided more than half the coal used in the USSR. The Germans inflicted tremendous damage on the Donetz Basin, they flooded the mines and blew up the mine buildings. Rehabilitation is well under way and output is rapidly approaching the pre-war level.



Second in importance is the Kuznetsk Basin in Western Siberia where the deposit of coal is about five times as great as that of the Donetz Basin. Kuznetsk is one of the world's richest coal fields and contains about two and a half times as much coal as the whole of England which was at one time known as Europe's coal scuttle.

Before the revolution the Kuznetsk Basin only provided coal for the engines on the Trans-Siberian Railway. During the period of the Five-Year Plans Kuznetsk became a big industrial

region. It grew still more rapidly during the war when it became the main coal provider to the Soviet rear areas.

Third in importance as a coalfield is Karaganda in Central Kazakhstan. During the war an important coal field also opened up in the Far North, in the tundras beyond the Arctic Circle. This new field is known as the Pechora Coal Basin. The known supplies of coal in this region are so great that it has earned the name of the Arctic Donbas. A railway line has been laid through the tundra wastes to the new town of Vorkuta to provide a means of transporting Pechora coal to the industrial regions.

The Moscow coal field lies between the cities of Moscow and Tula. The quality of the coal here is much lower than that of the other big fields, it produces less heat with more ash. Its great advantage is its proximity to Moscow and other important industrial regions.

As regards the output of oil the USSR comes second to the U.S.A. The biggest oil region of the country is that of Baku in Azerbaijan. Thousands of oil derricks form a veritable forest around the city. Countless pipes carry the oil to the gigantic reservoirs of the near-by refineries; petrol, kerosene, lubricating oils, and other petroleum products are manufactured close to the oilfields. The greater part of the oil crosses the Caspian in tankers from Astrakhan and is then transferred to oil barges for transport northwards up the Volga.

Other Soviet oil fields are Grozny and Maikop in the North Caucasus, the basin of the River Emba in Western Kazakhstan, the basin of the Ukhta in the Pechora region, in Georgia, on the Island of Sakhalin, in the western regions of the Ukraine, and in Central Asia. The Soviet Government is now developing another important oil field which is known as the "Second Baku." Actually this is a number of fields lying between the Volga and the Urals: they are at Ishimbai and Tuimaza in Bashkiria, at Krasnokamsk and Chusovskaya in the North Urals, at Syzran and Stavropol near Kuibyshev, and at a number of other

points. The first discovery of oil on the western slopes of the Urals was made in 1929.

More extensive use is now being made of natural combustible gases. These are usually found in oil-bearing regions. A number of factories in Daghestan, Bashkiria, and the Baku Region are already working on natural gas. At the time of the Battle of Stalingrad in 1942 a huge deposit of natural gas near Saratov (in the Second Baku zone) was surveyed. Experiments made at the Saratov factories showed that this gas may easily be used in place of coal hauled over long distances. At the beginning of 1945, without waiting for the end of the war, work was begun on Stalin's initiative to construct a five hundred-mile pipeline from Saratov to Moscow to provide more gas for Moscow's industries and for domestic consumption. A gas pipeline is also being built from the foothills of the Carpathians to Kiev, capital of the Ukrainian S.S.R.

The most important form of power, built up exclusively in Soviet times, is electricity. As early as 1920, when the country was still in the throes of the Civil War and hunger stalked the land, when the Soviet Union's economy was in a state of ruin, a commission working under the direction of Lenin began to draw up a plan for the electrification of the country, a plan that has become famous under the name of the GOELRO Plan. Lenin pointed out that it was essential to give the national economy a sound technical basis in modern big industry. He had in mind electricity. During the Soviet period hundreds of power stations have been built to provide the towns, farms, and industrial enterprises with electric power. The GOELRO Plan was drawn up for a period of ten to fifteen years but although its figures at the time seemed fantastic by 1936 they had been exceeded by one hundred and fifty per cent. By 1938 the USSR was producing twenty times as much electric power as pre-revolutionary Russia. (39,400 million kwh as compared with 2000 million kwh).

Power stations in the Soviet Union are designed to burn locally obtainable low calory fuels instead of the rich coal of the

Donetz Basin and the oil of Baku which have to be hauled over long distances. This is not only more economical but relieves the railways of heavy loads. The power stations at Stalinogorsk and Kashira to the south of Moscow, at Chelyabinsk and Berez-niki in the Urals, all work on local fuel: those at Shatura (near Moscow), Balakhna (near Gorky), Ivanovo, Yaroslavl and other towns all burn peat; the Donetz stations use coal dust, the Baku station uses natural gas, and the station at Archangel uses the sawdust and waste wood from the sawmills.

The building of hydro-electric power stations began only in Soviet times. The first big station was that at Volkhov near Leningrad, built in 1926. After this the huge Lenin Power Station on the Dnieper was built, followed by Rybinsk and Uglich on the Volga, and others on the Svir, Niva, Kura, Rion, Chirchik, and other rivers.

The hydropower stations work most effectively when they are combined with steam-driven stations. The hydrostation works day and night providing the main supply of current while the smaller steam driven station is switched into the grid to provide extra current at peak hours.

The constantly growing war industries of the Soviet Union demanded ever growing supplies of electric current during the war years. In the eastern regions of the country—in the Urals, Siberia, and Central Asia—a large number of new power stations was built. Some of the old power stations expanded to such an extent that they are really new enterprises. The Krasnogorsk Heat and Electric Power Station in the Urals, for example, developed to five times its original size during the war. This station was of minor importance before the war but it is now one of the biggest in the Soviet Union. Huge power plants are being built on the Irtysh in Eastern Kazakhstan, on the Syr Darya in Uzbekistan, and below Lake Sevan in Armenia.

Immediately after the Ukraine had been liberated from German occupation work on the rehabilitation of the Dnieper Power Station, the biggest in the Soviet Union, was begun.

The Metal Map

Without metal there would be no machines, without steel rails no trams, without steel and iron there would be no automobiles, turbines, or aircraft; without metal there would be no electricity. Without sufficient supplies of metal the USSR could not have defeated Germany.

The chief iron and steel district is in the south—the huge group of mills in the Ukraine at Stalino, Makeyevka, Yenakievo (Donetz Basin), Zaporozhye, Dniepropetrovsk, Dnieproderzhinsk (Dnieper Basin), Mariupol and others. These mills all use the coal of the Donetz Basin and the iron ore of the Krivoy Rog and Crimean iron fields. Many of them are built near the coal mines others in the iron fields.

Before the revolution three quarters of Russia's iron came from this region. Although the southern region's output of metal has been trebled in the Soviet period its share of the total output has become much smaller.

Second in importance is the iron and steel region in the Urals on the borders of Europe and Asia. In the Urals there are factories that were established in the seventeenth century. In the old days, the Urals factories, the serfs who were compelled to work in them, and the huge forests that surrounded them all belonged to feudal lords or to the state. Charcoal was used for smelting the iron. There was a time when iron from the Urals was exported to what are now the industrial countries of Europe and although some of the Urals ironworkers developed a high degree of skill the plants as a whole stood on a very low technical level. Their development was hindered by the remnants of the feudal system and by the fact that there was no good coal in the Urals suitable for the smelting of iron. The tiny Ural blast furnaces using charcoal as fuel could not compete with the big furnaces of the south that used the coke from the Donetz Basin. The Ural furnaces could not be made any bigger because the charcoal could not hold the weight of a big charge.

During the first years of Soviet rule the old Ural mills were partially reconstructed. This, however, was not enough, for the whole industry had to be reorganized to use coal as fuel. The Soviet Union's second coal center, the Kuznetsk Basin, was developed for the purpose of supplying the coal required by the Ural mills. In the course of a few years a huge industrial region developed in the Urals and Western Siberia.

The Ural-Kuznetsk Iron and Steel Combine was developed to work on the pendulum principle—there was plenty of iron ore in the Urals but no coking coal, while at Kuznetsk, 1250 miles away, there was plenty of coking coal but little iron ore. The Urals began sending iron ore to Kuznetsk and the same trains brought back coal. A number of other centers developed to use Ural iron and Siberian coal—Magnitogorsk, Nizhni Tagil.

All these new Ural plants are real giants with the most modern equipment; all the most laborious processes are mechanized and automatic.

The old Ural plants, on account of the fact that they burned charcoal, were built in the woods and on the banks of rivers down which timber was floated. They could not exist far from the forest zone although the richest ores were in the treeless regions of the south Urals. Now that coal is brought in from the Kuznetsk Basin the rich ores are all worked.

The best of the old charcoal-burning iron mills in the Urals were reconstructed.

At the Siberian end of the Ural-Kuznetsk Combine an iron and steel plant similar to the Magnitogorsk Plant was built at Stalinsk. The iron ore is brought from Magnitogorsk in what would otherwise be empty coal hoppers. Siberia now has its own metal industry.

During recent years a third partner has been added to the Ural-Kuznetsk Combine. Part of the coal used in the south Urals now comes from the Karaganda field in Central Kazakhstan which is nearer to the Urals than Kuznetsk.

In the years preceding the war the comparatively small iron

and steel industry of the Central Regions (Tula and Lipetsk) was considerably extended and uses local raw materials. The production of steel in Moscow and Leningrad also increased.

Electrometallurgy was a new industry that was developed in Soviet times; the Soviet Union is now one of the world's biggest producers of electro-steels. Alloys of iron and rare metals are made in large quantities—ferrochrome, ferrovanadium, ferrotungsten and others. These alloys are all needed for the manufacture of high-grade steels and were formerly imported into the USSR.

At the beginning of the war the Germans occupied the Ukrainian coal and iron fields but by this time the Ural-Kuznetsk Combine had been developed to such an extent that it was able to provide metal for the Soviet war industry.

During the war the Soviet iron and steel industry developed still more rapidly. In a short space of time two new blast furnaces, the biggest in Europe, were built at Magnitogorsk, and others were built at the Chusovaya and Nizhni Tagil in the Urals. The Chelyabinsk Iron and Steel Plant (in the Urals) with blast furnaces, open hearth furnaces, and the largest electric smelting shop in Europe was another wartime plant. Still another new wartime Ural plant was built for rolling tubing. At the beginning of 1944 the construction of the Kuznetsk ferrous alloy plant was completed. At the Chusovaya Iron and Steel Mill a new Bessemer shop built according to the most up-to-date design was erected and began work. Steel plants (so far without blast furnaces) have been built in the Far East, Kazakhstan and Uzbekistan; Georgia is building up its own iron and steel industry.

The rehabilitation of the iron and steel industries of the south has been under way ever since the Germans were driven out of the Ukraine. The first plant to be completely restored was that of Yenakievo; since then the other iron and steel plants of the Donetz and Dnieper Basins have been restored. In the first year after liberation ten blast furnaces, about forty open hearth fur-

naces, over twenty rolling mills and fifty-five cokeoven batteries were rebuilt.

In modern industry the non-ferrous metals also play an important role—copper, lead, zinc, aluminum, tin and nickel. To all intents and purposes the non-ferrous metal industry of the USSR dates only from the time of the Five-Year Plans. Here again the high point of development was reached during the war.

The Urals takes the lead in the output of copper. Such first-class plants as the Krasno-Uralsk Copper Smelting Works, the Pyshma Copper Refinery, and others were newly built while the old plants like the Karabash concession were reconstructed and enlarged. Next in importance to the Urals comes Kazakhstan with huge copper mines and refineries at Balkhash and several other points. There is also an important copper industry in Armenia.

Most of the country's lead comes from Kazakhstan where a huge group of refineries has been built at Chimkent.

Aluminum was not produced at all in old Russia. Under the Five-Year Plans aluminum works were built on the Volkhov (near Leningrad) and Dnieper Rivers and in the Urals. During the war the Urals produced more aluminum than all the works in the country had been producing before the war. A new aluminum plant was built in the Kuznetsk Basin during the war.

The Soviet Union is the only big power apart from Canada with a large supply of nickel. Before the revolution Russian nickel was not worked but the metal is now being produced in the Urals and in several of the northern districts.

The industry producing the rare metals—molybdenum, tungsten, chromium, vanadium, antimony, and others, has also been extensively developed, especially during the war.

Kazakhstan, the Urals, the Transcaucasus, the Transbaikal, and other regions are rich in rare metals. Soviet geologists have discovered hundreds of deposits which are now being worked.

Engineering was very poorly developed in old Russia and not

only intricate machinery but such simple things as scythes were often purchased abroad. When the Soviet government set about the task of industrialization the question of a domestic engineering industry was one of the foremost. During the Five-Year Plan periods the engineering industry of the USSR developed at a more rapid rate than any other industry. By the outbreak of the war the output of machines was already fifty times that of the pre-revolutionary figure. New branches of the machine-building industry were developed and the Soviet Union began to produce more machines than any other country in Europe. The country, however, still has need of many more machines.

The geography of the engineering industry has undergone a great change in the Soviet period. Before the revolution machines were produced in St. Petersburg, Moscow, and a few places in the Ukraine. The Five-Year Plans greatly developed the machine-building industries of the center where experienced skilled workers were available; the center began to specialize in the more intricate machines that do not require so much metal but demand a high degree of skill on the part of the workers employed. At the same time engineering works were erected in the new regions in the east where at first only simple machines were made as there were no "industrial traditions." This, however, did not last long for with the help of the central engineering industries the eastern regions soon gained the necessary skill and plants began producing intricate machines.

During the war engineering industries were rapidly developed in all the regions and republics of the eastern part of the USSR. The Urals, for example, not only built the bodies and engines of tanks but provided all the intricate equipment for them. A new tractor plant was built in the poorly developed steppes in the Altai region, an automobile plant appeared in the Urals and a locomotive works was built at Krasnoyarsk in the heart of Siberia.

Apart from the old but extensively reconstructed engineering centers like Leningrad, the country now has a large number of

new centers producing machines. This has meant a radical change in the economic profile of many towns in the east. Tashkent, for example, which had practically no industry before the Revolution, has become an important engineering center. Perhaps Novosibirsk has seen the greatest changes. This town which stands in the center of the Siberian plain was a small provincial township until recently; it is now one of the biggest engineering centers of the world.

The Farmlands

Only a view from the air could give us any real idea of the extent of the Soviet Union's farmlands. In the south and in the east, in the black earth steppes of the Ukraine, Moldavia, North Caucasus, the Volga Basin, the South Urals, and Western Siberia we find the great wheat belt. Nearer to the center of the country, in parts where there are greater numbers of towns with their factories and mines the corn fields are interspersed with truck gardens. In the forested country of the north the plowlands are mostly in the valleys of rivers and streams; here there are fine meadowlands between the corn fields and in many places the pastures have encroached on the forests. Central Asia is a land of green oases dotted about amidst yellow sandy deserts, dry stony wastes or plains of sun-baked clay. Man has brought water to the deserts, giving life to green orchards, fields of snowy cotton and paddy fields whose water gleams in the brilliant sun. From our airplane we should also see the tea plantations, tangerine, lemon, and orange groves on the terraced slopes of the hills of the sub-tropical Transcaucasus.

There is great variety in Soviet agriculture and the number of crops grown in different parts of the country has greatly increased during the Soviet period; only a few of the plants belonging to the equatorial zones are not grown in the Soviet Union.

The statistics of Soviet agriculture involve such huge figures that they are only comprehensible when given as comparisons. The cultivated area of the USSR amounts to about 500 million

acres. A good half of the West European countries could be fitted into this area. In 1940 over 120 million tons of grain were harvested from Soviet fields. It would require about seven million freight cars or 100,000 long freight trains to transport all this grain at once. (Tsarist Russia produced less than two-thirds of this amount).

Everybody knows that farming in the USSR is done on a tremendous scale. Before the war over half a million tractors were working in the fields and the grain was gathered by something like 200,000 combine harvesters. It is a wonderful sight on a hot summer's day to see long lines of these huge machines stretching right away across the steppes. The amount of land brought under the plow increases year by year. During the war the cultivated area increased by 100 to 125 million acres. Virgin ground is broken, forests are uprooted, and swamps are drained—everything at top speed and on a huge scale.

The general aspect of Soviet farming and the figures of its output are indivisibly bound up with the establishment of the collective farm system in the rural areas.

The Russian peasant had a poor time of it in pre-revolutionary days. The best land belonged to the big landowners, the rich farmers (*kulaks*), and the monasteries. Landless peasants worked in the fields of others for miserable rates of pay. Those who owned small plots of land also lived in dire poverty. The methods the small peasant owners employed were primitive and barbaric, they broke the ground with a wooden plow and planted seed by hand.

Soviet power gave over 375,000,000 acres of land to the peasants after confiscating it from rich landowners, monasteries and government institutions. All land ceased to be private property. For a long time, however, the peasants continued working their own land at their own risk. It was difficult to increase the harvests yielded by the fields when they were split up into tiny squares too small for the machines that would help produce extra for the market. At the same time it would have been im-

possible to build up the country's industries and so make the USSR independent without a marked increase in the output of farm produce.

The farmers, therefore, decided to plow over the bounds of their fields and join the tiny, backward farms into huge collective farms where the land and the means of production were owned in common; the farmers tilled the soil together using machines, tractors, and modern methods of scientific farming.

The overwhelming majority of the peasants of the USSR joined the collective farms. Many difficulties had to be overcome but the collective farms finally became firmly established in the whole country and became the deciding factor in farm production. In 1929 there were 20,000,000 peasant farms each of which planted about ten acres; before the Second World War broke out there were 272,000 collective farms each of which averaged 1,210 acres.

State-owned machine and tractor stations soon began to play an important part in farm life. There were 7,000 of these stations before the war. The machine and tractor stations own various farm machines, repair workshops and maintain a staff of agronomists. They work for the collective farms by contract.

Another type of farm organized in the USSR is the state farm. There are several thousand of them in the USSR as well equipped with modern machines.

The collective and state farms give the Soviet Union the world's most highly developed farm industry. By the end of the second Five-Year Plan, 75 per cent of the land was plowed by tractor, 94 per cent of the threshing was mechanized, 40 per cent of the grain crops were reaped by combines, while in the southern regions combines dealt with 60 per cent of the total grain crops.

The large areas of the farms and the intensive mechanization enabled Soviet farmers to make use of modern scientific methods of cultivation and to introduce a number of new crops. The Soviet Union is also one of the world's greatest grain producers.

The largest grain crop in the USSR is wheat which is sown over an area greater than the Black Sea, a larger area than is sown to wheat in any other country in the world. The wheat fields cover about a third of the total cultivated area. Soviet wheat is of very high quality; it is very nutritious and grows in a drier climate than that of many countries where wheat is planted. The main wheat belt is the black earth region and the wooded steppes; the belt narrows from west to east stretching from the Ukraine, the Don, Kuban, Central Volga, South Urals, Northern Kazakhstan to Western Siberia.

Before the revolution scarcely any wheat was sown outside this belt although climate and soil in the more northerly regions gave harvests that were 20 to 25 per cent better than those of the south where droughts were frequent. Small peasant farmers, however, could not afford to buy seed to change from one crop to another.

Today wheat is sown in the northern regions as well as the southern and each year the area under wheat increases. In Kazakhstan, Siberia, and the Far East state and collective farms are breaking more and more virgin soil. Grain farms have developed in formerly arid plains, tractors and combines are working on what was formerly unbroken steppeland.

The new wheat fields were a great help to the country during the war when the rich grain fields of the west fell into enemy hands. Until the enemy was driven out of the country, Siberia, the Urals, and Kazakhstan had to supply the whole USSR with bread, by no means an easy task but one with which they proved able to cope.

Rye and oats are very widely sown in the USSR, other important cereals being barley, millet, rice, and maize. Each region is able to specialize in those crops that are most suited to its climate, something that was impossible before planned economy was introduced. The small peasant farmers who were unable owing to lack of funds to compete for the market were forced to grow many different crops mainly for local consumption.

The present location of crops follows general scientific lines. The dry steppes of western Kazakhstan, for example, are planted mainly to millet which needs plenty of hot sun and little water. In the high mountain valleys and in the far north the hardy barley is sown; this plant ripens quickly in the short summers. New rice fields have been laid out where the ground is sufficiently level for water to be retained by low earthen walls; the first rice plantations were on the lower reaches of the Dnieper and in the Kuban while the old paddy fields of Central Asia and the Transcaucasus were developed and extended.

There is an even more clearly expressed specialization in the location of industrial crops which provide raw materials for industry. The country's rapidly growing industries require large quantities of fibers, oils, and vegetable dyes. The areas sown to industrial crops had to be extended and better harvest yields obtained. The share of industrial crops in the total output of the farms has been doubled in Soviet times.

The area of the cotton plantations and the yield of cotton per acre have increased to such an extent that the Soviet Union no longer imports cotton from abroad. Before the Revolution half the cotton used in the country was imported. In 1940 the Soviet Union grew 3.4 times as much cotton as in 1913.

The cotton plant loves the warmth and grows in the south, mainly in Central Asia and the Transcaucasian Republics: Uzbekistan is the biggest Soviet cotton producer. All these districts have artificially irrigated cotton fields. Before the war cotton was also grown in unirrigated fields in the southern regions of the Ukraine, in the Crimea, and in the North Caucasus.

Before the revolution the textile industries were far distant from the cotton fields: raw cotton was hauled from Central Asia and the Caucasus to Moscow, Ivanovo, and St. Petersburg. The Five-Year Plans provided textile mills for the cotton-growing districts in the Transcaucasus and Central Asia.

Flax, providing the raw material for linen, requires cool, wet

summers. Most of the flax in the USSR is grown in the north-western parts of the country—Kalinin, Smolensk, the Leningrad regions, and the Byelorussian S.S.R. The USSR is the world's biggest flax grower.

The USSR also has the world's largest area under sugar beet. The basic sugar belt is in the wooded steppes of the Ukraine and part of the Kursk Region. Before the Revolution these were the only regions cultivating the beet. Sugar was sent all over the country from here. During the Five-Year Plan periods and more especially during the war the sugar beet spread north, east, and south, to the Volga, the Urals, Central Asia, Kirghizia, Kazakhstan and West Siberia, right up to the Far East. It was discovered that the natural conditions obtaining in these regions, especially in North Kirghizia and Southern Kazakhstan, are exceptionally favorable to the cultivation of the beet. The new sugar industry which grew up in these regions played an important role in the national economy when the main Ukrainian sugar regions were in enemy hands. After the expulsion of the Germans from the Ukraine the sugar industry in that republic was rapidly rehabilitated.

Potatoes, planted mostly in the central regions and around the cities, are of great importance in the national economy. In addition to their use as food, alcohol is obtained from them, some of which is converted into synthetic rubber.

In Soviet times many new crops have been introduced into the country. Some of them have been brought from abroad, others have been found growing in a wild state and have been cultivated. The first category includes many subtropical and southern plants, like Chinese nettles which contain a valuable fiber, the tung tree which provides a very fine oil, the Algerian cork oak, and many others: an example of the second category is the kok-sagyz, a dandelion that was found growing in the Tien-Shan Mountains in 1931 and which is now grown for its rubber in all regions where the soil and climate are favorable.

A number of regions specialize in fruit-growing, viniculture, and melon cultivation. Georgia and Armenia are famous for their grapes. The Moldavian S.S.R. is a land of orchards and vineyards. Central Asia and the Caucasus also grow splendid grapes and other fruits. In the Crimea and the Caucasian littoral yellow-leafed tobacco is grown as well as grapes. Near Batumi and in Western Georgia there are tea and citrus fruit plantations.

The northern and eastern regions of the country formerly had scarcely any orchards on account of the severe winters; orchards were very rare north of the Kursk and Orel Regions where the famous Antonov apples grow. Ivan Michurin, the eminent Russian horticulturist, developed varieties of fruit trees that are impervious to frosts. Michurin's methods have spread all over the country and there are now orchards in the Urals, Siberia, the Far East, and in the North. Apple trees that creep along the ground like strawberry plants have been developed; these trees weather the cold winters under a thick layer of snow.

From this brief sketch it can be seen that the geography of farming is rapidly changing, new plants are being developed or acclimatised, varieties are being improved or completely new ones created.

We have now examined the geography, physical and economic, of the USSR in general. Now that we know the general line of the land it will be easier for us to appreciate the special importance of each of the districts we visit. Now let us begin in the heart of the country.

VI. THE CENTER

Moscow and its environs is behind us and the farther we travel from the capital the more the country loses its urban aspect and becomes thoroughly rural. Broad fields, dense forests . . . From time to time the landscape is broken by towns which occur

quite frequently in the regions of the R.S.F.S.R.³ which lie around Moscow.

THE RUSSIAN SOVIET FEDERATIVE SOCIALIST REPUBLIC (R.S.F.S.R.)

Territory: pre-war—6,400,000 sq. miles

Population: 1939—108,800,000

Administrative Divisions:

National Autonomous Republics:

Tatar	capital: Kazan
Chuvash	capital: Cheboksari
Mari	capital: Yoshkar-Ola
Daghestan	capital: Makhach-Kala
Mondovian	capital: Saransk
North Ossetia	capital: Dzaujikau
Komi	capital: Syktyvkar
Udmurd	capital: Izhevsk
Buryat-Mongolian	capital: Ulan-Udeh
Yakut	capital: Yakutsk
Bashkirian	capital: Ufa
Kabardin Balkarian	capital: Nalchik

There are also several autonomous regions and national areas.

Capital: Moscow.

Position in USSR: The R.S.F.S.R. occupies most of the central and northern belts of the USSR from the western frontier to the Pacific: it occupies three-quarters of the area of the USSR, contains about half the population, and is the most important economically.

The R.S.F.S.R. is the first among equals. The other republics enjoy exactly the same rights as the R.S.F.S.R. but acknowledge it the leader on account of the greater political and cultural maturity of its population, four-fifths of whom are Russians.

Although the towns of central R.S.F.S.R. are not so closely connected with Moscow as those of the Moscow region their

³ NOTE: Unless otherwise stated the regions described in this book belong to the R.S.F.S.R.

long connection with that city give them historical and economic features in common. They all form part of the old industrial region of Russia which grew out of the historical core of the country. It was here that Russia grew and gained strength as a state and it was here that her first industries appeared in the territory between the Volga and the Oka.

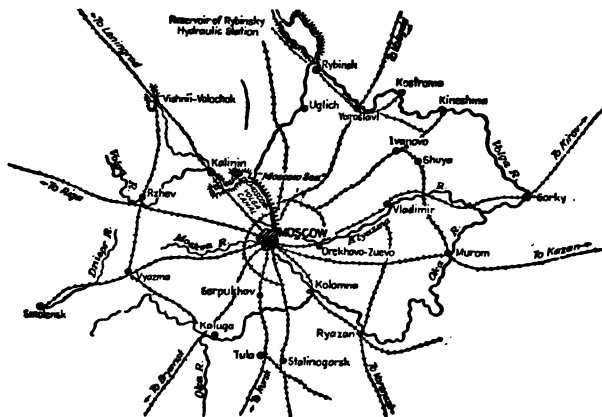
The forests of this zone are mixed deciduous and conifer which develop into pure conifer forests in the north and open out into wooded steppelands in the south beyond the Oka. The soil is mainly podzol although the southern part of the Volga-Oka Basin merges into the black earth (*chernozem*) region. The administrative regions which form the old center of Russia are Moscow, Ivanovo, Yaroslavl, Kostroma, Vladimir, Tula, Ryazan, and Kaluga; the Gorky and Kalinin Regions might also to some extent be included in this district.

This is a densely populated district with a population of 20,000,000 in an area of about 96,000 square miles. The total area is little more than one per cent of the whole USSR but it provides over a quarter of the country's industrial output. The vast majority of the population in this central, most progressive and most highly cultured region are Russians who played a leading role in the formation of the Russian state, in the revolutionary struggle against tsarism, in the Civil War when the fate of the Soviet State was being decided, and in the struggle against German fascism. This is the real heart of the USSR.

In order to put the plan for the industrialization of the country into effect the central regions, like Moscow, had to change the general nature of their industries: formerly a chiefly textile region it developed until engineering predominated.

Before the revolution the industrial concerns of the center worked mainly on coal brought from the Donetz and on crude oil from Baku. The deposits of brown coal in Moscow region have been fully surveyed and are being worked; the extraction of peat has become an important industry. These fuels are burned by the power stations which, added to a number of

hydro-electric stations form one huge power grid; a considerable area in the central regions, therefore, is able to dispense with long-haulage coal and oil. The total amount of coal brought to the center from the Donetz Basin, however, has not decreased but has, on the contrary, increased owing to the increased demand made by the industries of this region. Every saving of Donetz coal that has been made is consequently of paramount importance.



Great changes have taken place in the rural areas: the big state and collective farms with their modern machinery produce more vegetables, milk, meat, and flax than ever before while wheat, a new crop for zones where there is no black earth, has been introduced into the central regions of the country.

The railways leading out of Moscow in all directions have increased their traffic carrying capacity; new motor roads have been laid connecting all the towns of the old industrial center of Russia. Let us begin at the north of the Central region and visit each of the towns in turn traveling in a clockwise direction.

The railway which leaves Moscow in a northerly direction passes first through Zagorsk where there is the Troitse-Sergiev

Monastery and a wonderful museum of toys; the train then passes Rostov whose golden church domes are picturesquely reflected in the waters of Lake Nero and then on to Yaroslavl on the right bank of the Volga.

The Russians call Yaroslavl a "corner of Moscow." The history of Yaroslavl has much in common with that of Moscow; the latter in its early days was a jealous rival to all the other towns of the center but in the course of time became accepted as the capital.

In Yaroslavl the walls of the Kremlin and the old churches have been preserved since very ancient times. There is a shady, tree-lined embankment running along the Volga.

Before the Revolution Yaroslavl was a textile town. Heavy industry first made its appearance at the time of the Five-Year Plans. Today the majority of the new and rebuilt factories are engaged in the production of automobiles and spares. Other plants in Yaroslavl manufacture synthetic rubber, fabrics for motor tires, the tires themselves, and enamels for automobile bodies.

Textiles still play an important part in the economy of the region although engineering developed, especially at Rybinsk, in the pre-war years.

At Rybinsk the Sheksna River falls into the Volga—this is the beginning of the Mariinsk Canal System that was opened at the beginning of the nineteenth century for water communications between the Volga and St. Petersburg. The complete reconstruction of this system was begun before the war.

At Rybinsk and Uglich there are big hydro-electric power stations. The water impounded by the dams has joined the lower reaches of the Volga tributaries Mologa and Sheksna into one huge lake which is shown on the new maps as "Rybinsk Sea." The lake has completely changed the whole landscape; it has become a new factor in the life of the region and has forced the people to change ancient habits and customs. A fishing industry has grown up and there is shipping on the lake that differs from

that of the Volga; huge waves are formed on the lake which resemble those of the open sea so that the vessels used are of different construction from the craft which sail the tranquil waters of the Volga.

Downstream from Yaroslavl is the town of Kostroma on the left bank of the Volga. Like Yaroslavl, Kostroma is a regional center. It is also an old Russian town with its traditional row of shops and an ancient monastery; near the monastery the events described in Glinka's opera *Ivan Susanin* took place: during the Polish intervention in the seventeenth century the peasant Susanin led the enemy troops that were seeking Tsar Mikhail into a dense wood from which they could not escape; he was killed but his heroic deed saved his country. At the time of the Five-Year Plans Kostroma became an important center of the linen industry; there are also some engineering works in the town. One of the new bridges across the Volga is at Kostroma.

At the town of Alexandrov on the Moscow-Yaroslavl Railway there is a branch line leading northeast to Ivanovo, the Soviet Manchester, center of the cotton industry. Ivanovo grew up from two villages which, with the development of the cotton industry, grew together into a big town. During the Soviet period engineering works have been built which manufacture mostly textile machines.

Many of the towns in the vicinity of Ivanovo also produce textiles, mainly cotton but there is also some linen. This concentration of textile mills in one region is characteristic of the old industrial center of Russia. It grew up dozens of years ago when the capitalists at first exploited the labor of weavers working in their own homes but who became proletarian wage earners in a very short time. Factories grew up in the villages which then developed into towns.

The world famous village Palekh is also in the Ivanovo region. The work of the artists of Palekh, their beautiful caskets and snuff-boxes, their book illustrations, and their decorated porcelain have won high approval everywhere. Nowhere in the world

is there anything to compare with their quaint brightly colored miniatures. In Soviet times a State Museum of Palekh Art and a Palekh Art School have been established.

If we take the Moscow-Gorky Railway we pass through the town of Vladimir, the center of a region of the same name. On our way there we cut across the southern part of the textile zone where many large towns have grown up from the original villages: Orekhovo-Zuevo (like Ivanovo this town was formed from two towns that grew together), Noginsk (former Bogorodsk), Pavlov-Posad, and others. Most of the mills in this region turn out high quality textiles and industrial fabrics. There is also some heavy industry in this region, the Noginsk district producing high grade electric steels.

Vladimir on the Klyazma (a tributary of the Oka) is one of the oldest towns in Russia. Many centuries ago in Vladimir, Suzdal and Rostov the nucleus of northeastern Rus was formed. Southern Kiev Rus had begun to decline under pressure of the Tatars, but the seeds of Russia had already been sown in the soil of the north.

Vladimir has preserved some wonderful examples of ancient Russian architecture. The Cathedral of Vladimir served as a model for the Cathedral of the Assumption in Moscow. Not far from Vladimir is the Church of the Sanctuary on the Nerl River; the modest and pure beauty of this building cannot be expressed in words—it is the finest piece of architecture that has been created by the Russian genius.

Pre-revolutionary Vladimir, a dilapidated provincial town, was famous for its cloth. During the period of the Five-Year Plans the town was rebuilt and other industries such as the manufacture of automobile accessories, plastics, and gramophones were developed. During the war Vladimir began to produce tractors.

Further to the south runs the Kazan Railway line almost parallel with the Moscow-Gorky line; traveling along this line we pass the Shatura Power Station at a short distance from

Moscow—this was the first big power station in the USSR, designed to burn peat. A high tension transmission line carried on pylons conveys the current to Moscow.

On the three railways that lead southwards from Moscow (to Voronezh, the Donetz Basin, and to Kursk) there is a large group of towns within the territory of the old industrial center. The biggest industrial towns to the south of Moscow are Voskressensk, Kolomna, Ryazan (the center of Ryazan Region), Stalinogorsk, Podolsk, Serpukhov, and Tula (center of the Tula Region).

Tula is the oldest Russian iron and steel town, the oldest arms manufacturing district of the country. Not far from Tula lies the Moscow coal field which supplies fuel for the industries of the center. Almost all the mines here have been sunk in the Soviet period. The method of burning this comparatively low calory coal with its high ash content which Soviet engineers have developed made it possible to use it to replace a considerable part of the long-haul Donetz coal. This coal is now used as fuel for quite big power stations and provides raw material for the chemical industry.

In 1941 this important coal field came within the war zone and was badly damaged by the Germans. Immediately the Germans were driven out, the rehabilitation of the coal field began and before the war was over the output of the mines already exceeded pre-war.

The railway running southwest from Moscow passes through Kaluga (and then on to Kiev), another regional center where there are engineering and match industries. Kaluga also suffered badly at the hands of the Germans.

To the west and northwest of Moscow there are railways leading to Mozhaïsk (and then on to Minsk), to Volokolamsk (and then on to Riga), to Klin (and then on to Leningrad). Mozhaïsk, Volokolamsk, and Klin, as well as Vereya and Ruza are old Russian towns some of which were at one time the capitals of principalities and were the equals of Moscow; in the course

of time they lagged behind Moscow until they became quiet provincial towns. They were all devastated by the Nazis. This was part of the "desert zone" which the barbarians left behind them—houses razed to the ground, blown up churches, the corpses of murdered civilians . . . This ancient Russia, liberated from the enemy, has begun building again. New houses, new bridges—whichever way you look there is building under way.

2. DOWN THE VOLGA TO THE CAUCASUS

I. MOTHER VOLGA

THE TRIP DOWN THE VOLGA to the Caspian and then across the Caucasus to the Black Sea is one that has always attracted travelers, especially the Volga part of the journey. The Englishman Jenkinson in 1557 and the German Olearius in 1635 made the trip down the Volga during their Russian travels; their descriptions of their journeys were almost the only information concerning mysterious Muscovy which cultured Europe of that epoch had at its disposal. In 1859 Alexandre Dumas made a voyage down the Volga and his *Impressions de voyage en Russie*, a book filled with interesting anecdotes, amusing mistakes, and fantastic stories lend it a special charm for the Russian reader even today.

The Volga trip is popular because it enables the traveler to see much in a short time; he sees scenes that are beautiful but varied, he crosses the great Russian plain following the course of Russia's mighty river. The Volga has always played a much greater part in the life of our country than, say, the Mississippi in the U.S.A., the Yangtse Kiang in China, the Rhine and Elbe in Germany, or the Danube in Hungary.

One cannot imagine Russia without the Volga. Beginning with the ancient *bylini*, the old Russian folk songs, the Russian people have never ceased singing the praises of Mother Volga: the name Volga is often repeated in the old Russian "Chronicles" and popular myths have grown up around the river. We

come across the Volga on every page of Russian history: the Volga reminds us of Tsar Ivan the Terrible, of Yermak the conqueror of Siberia, of the leaders of popular insurrections, Stepan Razin and Yemelyan Pugachev; the Volga—the birthplace of Maxim Gorky and Vladimir Lenin. The Volga has a firm place in the minds of the people as the “Chief River” of the country.

The geography of the country has determined the exceptionally important role of the Volga in the history of Russia and in the life and economy of the USSR today.

The Volga and its tributaries as drawn on the map of the USSR remind us of a strange plant turned upside down, its roots to the north, its stem slightly bent at Stalingrad. The “roots” of this plant, the many tributaries of the Volga water the lands that were welded together into the Russian state. The ancient towns of Russia—Vladimir, Suzdal, Tver (now Kalinin), Yaroslavl, Kostroma, Ryazan, Nizhni Novgorod (now Gorky), Kaluga, Tula, and Moscow itself all grew up on the Volga or on one of the rivers of the Volga basin. The consolidation of Russia around the state of Muscovy began in the territory lying between the Oka, a right-bank tributary, and the Volga. The rivers which fall into the Kama, the main left-bank tributary of the Volga, all rise either in lands that have always been Russian or that were occupied by the Russians at a very early date.

It was quite logical, therefore, that when the Russians threw off the yoke of the Tatar-Mongols in the fifteenth century, formed themselves into a national state and began to spread over the huge expanses of their country, they should have turned first of all to the Volga along whose upper reaches the core of that state, Moscow Rus, had its origins. From that time on the Volga became the main traffic artery of the country and the Volga Basin became an important part of the Russian state and participated in every event of importance.

In the “Time of Troubles” (1605–1612) when the feudal boyars fought against the centralization of power, when there were peasant uprisings and internecine warfare brought about

by the struggle for the throne of Moscow, when Russia was weakened and a gang of adventurers from Poland seized Moscow with the intention of making the Polish Prince Wladislaw Tsar of Moscow; the towns of the Upper Volga came to the rescue of their country. The nobles, merchants, tradespeople, and the commoners of Nizhni Novgorod, Kostroma, and Yaroslavl collected funds, the rich brought out their gold dishes and furs, women contributed the rings from their ears, an army was raised and under the leadership of Minin and Pozharsky whose monument we saw on the Red Square in Moscow, liberated the whole country and restored order. In the eighteenth century the big insurrection (1773-1774) led by Pugachev took place on the Volga; outwardly it was an attempt on the part of the Cossack Yemelyan Pugachev to give himself out as the Emperor Peter III who had died shortly before; actually, however, it was desperate uprising of the serfs whose position had by that time become absolutely unbearable. The peasants burnt down the manor houses and hanged the landlords and the tsars' officers. A whole army was employed to put down the insurrection.

After the Revolution of 1917 the Civil War which followed developed into a struggle for the Volga Basin, the mastery of which was a matter of life and death to the still weak Soviet Republic: the Volga meant bread and oil for Moscow. In the defence of Tsaritsin, the keypoint on the Volga, Stalin's genius as a military leader came to the fore. In commemoration of this great Civil War battle Tsaritsin was renamed Stalingrad.

In our times the greatest battle fought by the Soviet people against Hitler's armies took place under the walls of that same city of Stalingrad; it was here that the idea of a *Blitzkrieg* was proved ridiculous and it was here that the offensive of the Red Army began and continued almost uninterruptedly until Germany surrendered. The Red Army's victory at Stalingrad was the turning point in the whole Second World War; it determined the final victory of the United Nations.

The names of the great people who have grown up on her

banks, the historical events that have taken place there, the tremendous role which the river plays in the country's economy and the emotional influence which the Volga has had on the Russian spirit as depicted in our folklore, songs, and literature all serve to confirm the river's right to the title of the "main artery" of Russia.

II. FROM MOSCOW TO THE VOLGA

THERE are several ways of getting to the Volga from Moscow. The most interesting way is by water, by the Moscow-Volga Canal which will take us to the town of Kalinin. Above Kalinin the Volga is a tiny stream which will not carry anything but the smallest craft. As we have seen, the railways running to the east and northeast from Moscow all lead to towns on the Volga—Kalyazin, Rybinsk, Yaroslavl, Kostroma, Kineshma, and Gorky; some of these towns we have already visited. There is another way by water—down the Moskva River to the Oka to its confluence with the Volga. At this confluence stands the town of Gorky which is the real gateway to the Volga for above the town the Volga is not so wide, it is not that breath-taking giant that it is from Gorky to the Caspian. It is the scale of everything connected with the Volga that distinguishes it even from the other big rivers of Russia.

Probably the most interesting route from Moscow to the Volga is that by way of the Oka. This journey may begin in the very heart of the capital, from the Southern Port (the Northern Port is at Khimki but this would take us along the canal to Kalinin).

The vessel leaves the quay of this port and crosses an artificial lake created by impounding the Moskva outside the city. On all sides there are warehouses, wharves, cranes; there is a short halt as we go through the first locks and then we pass on the right the village of Kolomenskoye whose famous old church we have

already visited. On both sides of the river is the calm rural landscape of Central Russia.

At one time Moscow was called "white-stoned." The Russian plain is extremely poor in building stone; in the old days stone buildings were few and far between in this densely wooded region where even the defensive walls of the cities were built of timber. The magnificent buildings of Moscow, the churches, the palaces of the tsars, and the stone bastions were an exception of which Moscow was proud. As we pass down the river we see the ancient quarries from which the limestone was taken for the buildings that gave Moscow the poetic name of "white-stoned." They lie around the mouth of the Pakhra River near the big village of Myachkovo. From time immemorial the people of this village have been stonemasons. The limestone from Myachkovo was taken up river to Moscow.

The vessel passes long flat hills between which there are waving fields of yellow rye, wheat, oats, and buckwheat, fields of vegetables which supply the city, groves and groups of trees that still remain from the dense forests that once covered the whole of this region. Here and there we see the white belfries of the village churches while occasionally there are tall brick buildings on the banks of the river—schools and rest homes. There are many villages but here near Moscow the houses still closely resemble those of the town. The log-built walls are usually board covered, iron roofs are more frequent than shingled and many of the houses have glass-walled verandas.

The Moskva joins the Oka at Kolomna which was once one of the fortresses that shielded Moscow from the Tatar raiders. From the river we can see the remains of Kolomna's Kremlin walls and the domes of its many churches. After the Tatar period Kolomna fell into decay and was largely abandoned until the period when capitalism developed in Russia and the country's first locomotive works was built there. This factory still exists today and plays an important part in the national econ-

omy. Most of the inhabitants of the town are connected with the locomotive works; according to the 1939 census there were 75,000 inhabitants.

After leaving Kolomna our route passes down the Oka across the Meshchora Plains with its famous forests. These forests served to hinder the Tatar raids on Moscow, for the horsemen of the plains were at a loss in dense growths of trees and the swamps formed by the countless shallow streams.

From our vessel on the Oka we do not get a good view of typical Meshchora forest lands. The slope of the land is very gentle here and as a consequence the current of the Oka is extremely slow. The extensive pasture lands along the banks, covered with water at flood times, form the main wealth of the Oka villages; they provide the grass and hay for the collective farms which in this region raise dairy cattle.

The villages that we now pass no longer have any resemblance to town communities. They are usually at some distance from the river on the steep slopes of the valley well above the level of the lands that are flooded every spring when the snow melts. As the eye wanders over the huge expanses of green meadowland these tiny groups of picturesque timbered houses in the background are a pleasant relief. The combination of bright green meadows and dark gray log houses is typical of Central Russia and is seen at its best along the Oka.

The river is not deep and a project for the construction of several dams has been drawn up which will not only make the river navigable to bigger vessels but will also provide water-power for the production of electric current. It is expected to begin work on this project during the next few years.

There are two famous towns on the Oka between Kolomna and Gorky—Ryazan and Murom; in 1939 the former town had a population of almost 100,000. Both towns have developed their industries during the Soviet period and most of the inhabitants are engaged in machine shops, food processing, and furniture factories.

Ivan Pavlov, the famous Russian physiologist, was born in Ryazan. The village of Karacharovo near Murom is believed to be the birthplace of the hero of Russian legend, Ilya Muromets.

Both towns are very old as one can see from their outward appearance; there are picturesque churches with domes of different colors surmounted by gilded ornaments all huddled together, the streets are narrow and winding and there are large numbers of ancient buildings.

As the vessel gets nearer to Gorky the factory settlement of Dzerzhinsk which has grown up almost entirely in Soviet times, offers a great contrast to the general landscape with its big blocks of apartment houses backed by tall factory chimneys. The people of Dzerzhinsk are employed in the huge chemical plants seen in the distance.

III. THE TOWN OF GORKY

HERE we are at Gorky where our ship enters the Volga. As soon as we get on to the Volga we realize that dimensions are different. On both the Oka and the Volga, above and below the confluence there are numerous wharves and quays that form a belt round the town. There are wharves for unloading grain and oil, wharves where bales and boxes are handled, passenger quays—"river stations" they are called in Russian—wharves for upriver and downriver freights and wharves for the Kama traffic. Vessels of all sorts are tied up at the wharves loading and unloading. Strings of trucks and carts come and go while the clang of the tram bell draws our attention to ordinary city traffic.

The river itself is as busy as the banks; craft of every conceivable type are moving in all directions—steamers, barges, tugs, motor boats, fire-floats, rowboats, and ferries.

Gorky is the biggest city on the Volga and sixth in size in the Soviet Union. Its 1939 population was 650,000. There are still many relics of the past to be seen. On the cliff of the right bank

where the two rivers meet stands the ancient Kremlin, high above the surrounding country and in the city itself are numerous churches all of which serve to remind us that Nizhni Novgorod was once the capital city of an important principality. The merchants' houses, banks, offices, and the Bourse in the center of the city, the huge market place at Kanavino (now part of the city) where the Novgorod fairs used to be held, old wharves that still bear such names as "Siberian," "Astrakhan," etc., are relics of a later day when the merchants and factory owners reigned supreme on the lower Volga. The nineteenth- and twentieth-century Volga merchants provided a whole gallery of types for the novels of Maxim Gorky who spent the years of his childhood and youth on the Volga; he wrote his earliest stories at Nizhni Novgorod and in them we feel the tempestuous boldness of the great Russian river, the scope and passions of the busy city which now bears his name.

The industrial concerns which were originally built mostly to serve the needs of the shipping trade are only slightly younger than the Novgorod Fair: the most important of them was the Sormovo Shipyards and Engineering Works where vessels of all types are still built, even big steamers for the Caspian which sail down river in the early spring floods. Gorky was an important manufacturing town before the Revolution but during recent years its industries have grown beyond all recognition. The Molotov Automobile Works, the biggest in the USSR is a Soviet innovation. Motor cars and trucks from Gorky are the most commonly seen in all parts of the Soviet Union. Today part of the plant is being recast for the mass production of the "Victory" limousine.

The Molotov Works is a whole city in itself—huge factory buildings with glass roofs, asphalted clearways between them, light railways and electric cars for internal factory transport and a wide expanse of open yard where the automobiles that come off the conveyor are collected. The Gorky automobile plant was built as a single unit and therefore has many advantages over the older plants that "just grew."

Close beside the works is the factory housing estate complete with clubs, hospitals, kindergartens, and nurseries; the factory estate has several thousand inhabitants.

A number of new industrial towns have grown up around Gorky including the Balakhna Paper Mills, the biggest in the USSR, with its near-by housing estate of Pravdinsk.

A new steel structure across the Oka now replaces the old pontoon bridge of pre-revolutionary days; in general Gorky has grown and changed considerably. A railway bridge across the Volga just below Gorky provides an additional line from Moscow to the Urals. The town now contains a university and a number of other colleges, several new theaters and museums.

Gorky is the chief town of a rich region with almost four million inhabitants. The region is a mixed one with industrial centers resembling those of the Moscow Region, dense woods of the northern type and on top of all the Volga. The primeval woods along the rivers Kerzhenets and Vetluga (left tributaries of the Volga) remind us of the "northern" origin of the Volga which gathers its waters mainly from the northern regions that are damp, cool and wooded. In the old days the woods along the Kerzhenets and Vetluga provided the schismatists—the non-conformists of the Orthodox church—with a refuge from the persecution of the authorities and the official church; they built their "hermitages" in the densest forest thickets. Here there is the famous Lake Svetloyar, a deep karst-hole filled with transparent water in which the clouds and the surrounding pine-clad hills that seem to float like fairy castles in the blue sky are reflected in beautiful pictures. There is a very poetic legend about this lake—it is said that at the bottom of the deep hole the town of Kitezh was miraculously hidden when it was threatened with a Tatar raid. The miracle was a reward for the piety of the inhabitants. Rimsky-Korsakov's opera *Tale of Kitezh* has this legend as its subject.

The large number of old industrial towns that specialize mainly in engineering and the production of hardware (Kulebaki, Vyksa, Arzamas, Pavlovo, Vacha, Bogorodsk, Lyskovo, and

Vorsma) tell us that this region is an integral part of the industrial center; the industries here go back to the days of artisans working in their own cottages who turned out knives, locks, tools, and similar small metal articles. The artisans have now formed co-operatives that not only work for the market but fill orders for the big factories; some items used by the automobile works in Gorky are made in these smaller co-operatives. The co-ordination of the work of these small artisan co-operatives with production in big state-owned factories is an interesting feature of Soviet planned economy.

IV. THE STEAMER

AT GORKY we have to tranship to another steamer or motor vessel for the trip down the Volga. The big vessels that plow the deeper waters of the Volga from Gorky to the river-mouth cannot go further upstream than this point, or up the Oka.

The steamer itself is an indivisible part of the Volga: every traveler on the great river remembers the steamers as something closely bound up with it. The people who live along the river know every detail of every vessel and long before they come into sight around the bends can name them from the notes of their sirens. The steamers that ply the Volga from Gorky to the mouth are big three-deckers. They are painted white and gleam with the glass of cabins and saloons; each vessel is a floating hotel. The trip down the Volga is one of the most popular holidays in the USSR.

VOLGA

Length: 2,350 miles (longest in Europe)

Basin: 530,000 sq. m.

Chief tributaries: (right) Oka—950 m., (left) Sheksna, Vetluga, Kama (1172 m.)

Height of source: 7500 feet above sea level (Valdai Heights WNW of Moscow).

Height of Mouth: 85 feet below sea level (level of Caspian)

Navigation period: 193 to 256 days.

Annual Increment:

Rainfall 464 mm.

Evaporation 317 mm.

Increment 147 mm.

The steamer leaves Gorky from what is called the river station, or, as the Volga people say, she "casts off." The order to let go the ropes is given and the huge loops of hawsers as thick as one's arm are slipped from the bollards, the paddle wheels begin to churn up the water (paddle steamers are better than screw steamers in passing over the sand bars): with first her port and then her starboard wheel turning, the huge vessel slides smoothly away from her moorings. From the decks and cabin portholes the passengers get their last view of Gorky as the ship, vibrating so slightly that it is scarcely noticeable, steams out into the fairway.

The middle reaches of the Volga, the stretch between Gorky and Kuibyshev, flow through a comparatively densely populated wooded steppe region where the landscape has been greatly changed by centuries of man's activities; expanses of forest land have been felled and the black earth is intensively cultivated.

The scene is one with which we are already familiar, the soft colors of the Central Russian landscape—the expanses of farmland are broken by groves of trees and narrow strips of forest, here and there tiny villages with the belfries of their churches rising picturesquely above them, a blue sky with swiftly fleeting clouds which gives the whole scene a soft lighting effect with plastic depth. The air over the water after we have left the big towns is pure and transparent and every detail of the landscape, even at great distances stands out with remarkable clarity. The change from flat fields and the meadows of the floodlands to long, low hills, the occasional bunches of trees and the villages dotted along the river all give variety to the scenery which is not so fatiguing to the eyes as glaring and sudden changes. The

picture that is impressed on our vision from the ship's deck is one that is built up from "average magnitudes," only the Volga itself which flows through this moderately variegated landscape is noticeable for its tremendous size. Its width in these middle reaches varies from one to two miles.

Almost throughout the entire length of the Volga the right bank is high and steep (it is locally called the "cliff bank") while the left is low meadowland (hence—the "meadow bank"). The Volga gives us a particularly vivid example of a well-known geographic law according to which rivers in the northern hemisphere try to flow away to the right under the influence of the earth's rotation. The Volga is washing away its right bank, naturally at "geological speed" which is scarcely perceptible. To the left there are very extensive floodlands which are completely covered with water during the spring: the rich alluvial soil deposited here by the river provides an excellent crop of succulent hay.

The fairway in the river lies mostly close to the right bank but it sometimes capriciously wanders over to the left. The Volga is a river of the plains with a comparatively slow current: much matter is suspended in the water, especially at flood time when it is visibly muddy. The mud and sand are deposited to form bars and the river pilot has to have an excellent knowledge of the river before he can take a vessel through with the confidence of a Volga captain. The Volga, incidentally, is well marked for the benefit of the pilots. The fairway is marked with buoys and flags on both sides; at night these are lit up to show the road for the vessel to take. The buoys are tended by a whole army of men who live in little isolated cottages on the river bank and visit their charges regularly in small boats. To make changes in the course easier there are "signposts" on the bank; they are surmounted by geometrical figures and are so arranged that the helmsman always has to keep two of them in line to keep on his course.

The shallows and sandbars change year by year according to the nature of the floods while the depth in different parts of the

river may change in the course of one navigation season on account of rains, even those falling at great distances; for this reason the "critical passages" of the Volga are constantly being measured. The results of this work can be seen from the decks of our vessel: clearly outlined against the blue sky there are cubes and balls of various sizes on high poles. Each of these has its value—a meter, 20 centimeters, five centimeters. By adding up the values of the marks the pilot finds the depth of the water over the sandbar.

V. NATIONAL AUTONOMY ON THE RUSSIAN RIVER

BEFORE we have traveled far from Gorky we have reason to remember that the USSR is a multinational state whose constitution guarantees every nationality the right to political autonomy and the possibility of putting it into effect, that is the right to build up its own national economy and culture. Each of the smaller nations whose size gives it no claim to the right to form its own constituent republic, or a nation that lives in the heart of the USSR and would therefore be unable to secede from the USSR should it so desire (one of the most important constitutional rights of a constituent republic of the USSR) is able to effect national autonomy by forming an autonomous republic or autonomous region within the constituent or union republic in which its territory is situated. We shall see many of these autonomous republics on our travels. Three of them lie on the Volga below Gorky—on the right bank there is the Chuvash Autonomous Soviet Socialist Republic (A.S.S.R.) with a population of slightly over a million and on the left bank the Mari A.S.S.R. (The Maris were formerly known as Cheremiss) with a population of about 600,000; below them, on both banks of the Volga and the lower reaches of the Kama is the Tatar A.S.S.R. with a population of nearly three million. In the fifteenth and sixteenth centuries the lands settled by these

"foreigners" as the national minorities were called in tsarist times, came under the rule of Muscovy, some by voluntary alliance, others as the result of the brilliant victories won by Ivan Grozny (usually called "the Terrible"). The further development of this whole region was badly hampered by the national policy of tsarism: the "foreigners" were in many respects without rights, they had few schools in which the native language was used with the exception of the religious schools in Tatar where education was in the hands of the mullahs; a large part of the land, even in the period when the region was being incorporated into Russia, was presented to newly arrived landlords who rented it to the native population at high prices.

It is no wonder that the region was backward: the "foreigners" on the Volga interested ethnographers but not the government.

The situation was radically changed after the Revolution when national autonomy first made its appearance on the Volga. The Chuvash, Maris, and Tatars soon made economic progress in their republics. Some of the successes achieved have been so great that in some respect the tiny national republics could serve as an example to the bigger constituent republics of the Union. The Chuvash A.S.S.R., for example, is famous throughout the USSR for the splendid roads that the Chuvash collective farmers themselves have built. Many talented people have come forward from amongst the Chuvash, Maris, and Tatars who are working with great persistence to show their compatriots the road to a richer and more cultured way of life.

The local peasants formed collective farms, obtained technical help and agronomical advice from the state through the Machine and Tractor Stations (there are 120 of them in the Tatar Republic alone) and have greatly extended the land under cultivation, increased the harvest per acre and improved their animal husbandry. Local industry is making good progress in the smaller town (Yoshkar-Ola, capital of the Mari A.S.S.R., Cheboksari, capital of the Chuvash A.S.S.R., Kozmodemyansk,

Tsivilsk, Kanash, Zelenodolsk, and others). Newspapers are published in the native languages, a large network of new schools has been established and there are national theaters and clubs. Almost the entire population is now literate whereas before the Revolution, on the territory of the present Tatar A.S.S.R., for example, only sixteen per cent of the population could read and write.

These changes in the lives of the national minorities on the Volga are to be seen to greatest advantage in Kazan, capital of the Tatar A.S.S.R. Kazan is an old Volga trading center and is one of the biggest towns on the middle reaches. Kazan, unlike most of the Volga towns is on the left bank of the river.¹ The left bank is low and is flooded every spring so that there are few sites suitable for the building of a city close to the river. Kazan is separated by a two and a half mile stretch of floodland from the wharves and warehouses on the river bank; these latter are in annual danger of flood. There is a tramway service between the wharves and the city. There are a few small clusters of houses in the floodlands inhabited by families that have been engaged in the building of wooden vessels and barges since the eighteenth century; the tiny shipyards are situated at the confluence of the Kazanka stream and the Volga. One of these hamlets, incidentally still bears the name of "Admiralty" a relic of the "River Admiralty" that existed in Kazan at the time of Peter the Great. Beyond the Kazanka stream today there are big engineering and chemical plants and small housing estates inhabited by their workers.

As we approach Kazan we get a fine panorama of the city. The outstanding feature, as in Moscow, is the Kremlin, the ancient citadel built by the Russians in 1552 when Kazan was reduced by Tsar Ivan Grozny (the Terrible) after a long

¹ On the right bank there are the cities of Kalinin, Rybinsk, Yaroslavl, Kineshma, Gorky, Cheboksari, Ulyanovsk, Saratov, Volsk, Kamyshin

and Stalingrad while on the left bank there are only Kostroma, Kazan, Kuibyshev and Astrakhan.

siege. With Kazan Tsar Ivan conquered the whole Khanate of Tataria which till then had kept Muscovy shut off from the Volga. Little remains from the times when Kazan was the capital of the rapacious Khanate of Tataria; the Russians blew up the old walls with their petards before storming the city while the bastions and minarets were leveled with the ground as a sign that the long struggle between Kazan and Moscow was over. One tower alone remained, the Suyumbeki, which now gives the Kazan Kremlin a silhouette of distinction; the latticed cone of its Asiatic architecture stands out amongst the countless domes and steeples of the churches and monasteries. Strangely enough the Suyumbeki Tower reminds us of something we have seen in Moscow. The tower was the model on which the architect Shchusev based that surmounting the Kazan Railway Station and several of the towers around the walls of the Moscow Kremlin also remind us of Suyumbeki.

According to the census of 1939 modern Kazan is a city of 400,000 inhabitants. It is the biggest cultural center of the whole Volga Basin. It contains an Affiliate of the Academy of Sciences of the USSR, several research institutes, a number of higher schools, most outstanding of which is one of Russia's oldest universities (Lenin attended Kazan University). In the Tatar A.S.S.R there are twelve higher educational establishments, most of them in Kazan, which in 1945 were attended by 1,140 Tatar students; this figure is all the more astounding when we realize that during the 113 years of the Kazan University's pre-revolutionary existence a total of six Tatars were graduated.

There are good theaters in Kazan among them a Tatar National Opera House which plays the works of Tatar composers.

Kazan has become an important industrial center of the Volga Basin. In place of the tiny tallow and soap-boiling home industries which formerly sent candles and soap all over Russia there is a big chemical, perfumery, and soap industry: there are new engineering works, light industry and food processing plants, a factory making typewriters, a big plant for the processing of

furs, a factory making cinema film and the biggest felt works in the USSR. In 1941 the industrial output of Tataria was seventeen times that of pre-revolutionary times and it was doubled during the war.

At a point about forty miles below Kazan the chief tributary of the Volga, the Kama, joins it; the Kama rises in the North Urals. The Kama watershed is very extensive; the basin of this river is bigger than Switzerland or Spain and is almost as big as France. Throughout most of its length the Kama flows through coniferous forests. It flows through some wonderfully picturesque spots, especially nearer the source and is in general sterner and more majestic in appearance than the Volga. The dark green of the pines surmounting the dark red clay of the gullies that run into the river are a great contrast to the bright green meadows and trees of the Volga. The dark tones are repeated in the waters of the Kama and for miles past the confluence their waters do not mingle. From the deck of our ship we can see the dark waters of the Kama and the clear waters of the Volga flowing side by side.

Around the mouth of the Kama there is always a large number of barges and tugs that carry freights up and down the two rivers. Not far from the rivermouth is the village of Bulgaria where there are interesting relics of the capital of the ancient Kingdom of the Volga Bulgars, destroyed by Mongol raiders in the thirteenth century. The "Black Chamber," "Small Minaret," ruins of bathhouses with earthenware pipes for the supply of hot water and the size of the city ruins all speak of the high state of civilization existing in the period between the ninth and thirteenth centuries. Bulgaria is well known to us from the writings of Arab travelers; the researches of historians tell us that the Bulgar Kingdom carried on a lively trade with the Slav tribes and principalities and with the people of the North East—the "Biarritz." The ruins of Bulgaria form an archeological preserve where excavations still continue.

VI. THE SAMARA OXBOW

AFTER leaving the territory of the Tatar Republic our steamer passes Ulyanovsk which stands high on the right bank of the Volga. Very little of the town is visible from the river as the bank is high and steep. The spring floods cause landslides where the river has eaten away and undermined the bank; these are particularly dangerous in the neighborhood of the railway bridge which crosses the Volga at this point; work on the strengthening of the riverbanks is almost continuous in the vicinity of the town. Ulyanovsk was the birthplace of Lenin.

As we sail steadily downstream we notice a constant change in the landscape; the clusters of trees become rarer and we see more open green and yellow fields of corn. The wooded steppe is developing into the purely treeless prairie type of steppeland.

Before the forests cease altogether they provide us with the beautiful panorama of Zhiguly.

The Volga uplands, a hilly plateau on the right bank of the river send spurs branching out to the east, the low but steep Zhiguly Hills, formed of limestone. The Volga cuts into Zhiguly in a stubborn endeavor to retain its original course, forms a big loop around the eastern end of the spur thus forming the Samara Oxbow. Zhiguly, washed on three sides by the mighty river forms a peninsula. The picturesque summits of the hills are densely overgrown with a shaggy pine forest which forms a beautiful color scheme with the white limestone of the almost vertical cliffs and the smooth blue waters of the Volga. The "caps" of the Zhiguly hills rising to some 450 to 600 feet above the level of the river are dense coniferous forests. They are linked to the river by gullies filled with bright green deciduous trees; in places where the gullies are wider the forest is more open exposing to our view beautiful little valleys in this miniature "Volga Switzerland." The stone quarries and lime kilns that lie between the Volga and the cliffs load their stone and burnt lime straight into barges on the river below.

Directly opposite the apex of the Samara Oxbow stands the town of Kuibyshev, the former Samara, which before the war had a population of about 400,000 inhabitants. From a beautiful new river station situated on an asphalted embankment one may go up past the city gardens to the main street which runs parallel to the river. The beautiful buildings of the banks, offices and hotels are a relic of the days when the merchants of Samara had the whole of the Volga grain trade in their hands; the country cottages and villas which belonged to the same grain kings stretch along the Volga for several miles (today they are sanatoriums, rest homes and summer camps for school-children).

Modern Kuibyshev is more important as an industrial than as a trading center: there is a whole complex of engineering, electrical and chemical plants in the town in addition to steam mills and grain elevators.

At the same time Kuibyshev has retained much of its importance as a commercial and transport center.

Every point where a railway makes contact with the Volga is naturally a center for transferring freights between the railway and the river; at these points there are always warehouses, grain elevators, wharves and docks where vessels can winter.

At a short distance from Kuibyshev one of the most important railways in the Soviet Union crosses the Volga. Marshaling yards and goods stations in the vicinity of Kuibyshev, at Syzran and Batraki on the right bank and at Kinel and Bezymyanka on the left bank handle goods arriving by hundreds of routes from Siberia, the Urals, from Central Asia to the center and back. The railway bridge across the Volga at Batraki between Kuibyshev and Syzran is one of the biggest in Europe.

As we approach Zhiguly we see here and there dotted about the gullies isolated oil derricks and occasionally bunches of them together. As we turn round the oxbow we see a whole forest of them at Syzran and beyond them the characteristic contours of an oil refinery. The western edge of a large oilfield stretching from the Urals to the Volga rests on the Samara

Oxbow. This oilfield was discovered by Soviet geologists. The systematic study of this huge area on the insistence of the late Academician Gubkin led to the opening of the following oil centers in the pre-war years: Stavropol,² Syzran, Krasnokamsk, Buguruslan, Ishimba, Tuimaz and many others in the Volga Basin, the Western Urals Area, and Bashkiria. This huge stretch of oil-bearing territory is still being surveyed and will no doubt provide still more profitable oil workings; in the Soviet Union it is called the "Second Baku." This name shows the belief of Soviet geologists in the fact that the region will in the future play as important a part in the economy of the Soviet Union as Baku, one of the most famous oil centers in the world.

The comparatively small River Usa cuts across Zhiguly and enters the Volga at the northern end of the Oxbow; the source of this river is only a mile or two from the southern end. This river is a favorite haunt of the children and youth of Kuibyshev. In summer an excursion may be made by boat down the Volga to a village which bears the picturesque name of Perevoloki or the Portage, and which lies opposite the point where the upper reaches of the Usa are nearest to the Volga; here a boat is loaded on to a cart and launched again on the Usa where it floats back to the Volga with the current and again by the same means back to Kuibyshev almost all the way without using the oars. This is a traditional outing that takes from ten days to a fortnight and is locally called the "round the world cruise."

If a dam with a power station were built across the Oxbow at Zhiguly the Volga waters which it impounded would fill the valley of the Usa. At Perevoloki the waters of the river may be diverted southwards and a second power station built. The potential of these two power stations is about 3,000,000 kilowatts which is more than the biggest existing power grid in the world.

The Kuibyshev power center is projected as one of the links in the titanic work of transforming the Volga from source to

² Not to be confused with Stavropol in the North Caucasus.

mouth and converting it into a gigantic staircase of dams and reservoirs. At Ivankovo (the beginning of the Moscow-Volga Canal), at Rybinsk and Uglich the upper steps of this staircase have already been built. The next step will be formed by the dam that is to be built at Gorky and below this comes the Kuibyshev complex of hydraulic engineering works. Still other steps will later be built lower down the river. The exact places and nature of the dams, the sequence in which they are to be built and the time when the work can be commenced are still under discussion.

When all these dams have been built the whole aspect of the Volga landscape will change. The water impounded by each of the dams will stretch back to the previous one forming a chain of long lakes which in some places will be a dozen or more miles wide. This river of lakes will require a different type of vessel from those now in use. The flat-bottomed paddle steamers will be unable to contend with the waves that will be raised by the wind on these wide expanses of water. Many villages and even some towns will have to be protected from flooding or transferred to high positions as was the case when the dams on the Upper Volga were built.

All these changes will serve as a tremendous stimulus to the economy of the Volga Basin and not of that basin alone: milliards of kilowatt hours of very cheap electric power will be sent to the Urals and to Moscow. This, however, is all a matter of the future.

VII. THE VOLGA STEPPES

SOUTH of Kuibyshev and Syzran the Volga becomes a river of the steppes; the trees are confined to narrow green belts in the immediate vicinity of the river with very rare groves on the high bank and clusters of willows in the floodlands. Stretching right away from the Volga are endless fields of wheat—the Volga

breadbasket. The giant plain of black earth is covered with hundreds of tractors or combines when plowing or harvesting is in hand; this is a region of intensive, mechanized farming.

Long strings of steel barges heavily laden with Caucasian petroleum make their way slowly upstream; huge rafts of logs, several hundred feet in length, each bearing a little house in which the raftmen live, float downstream with the current. When the raft arrives at its destination in the treeless steppes the log hut will also find a buyer. The log cabins on the lower reaches of the Volga often come from this source. Steam tugs that exchange greetings with their sirens as they pass each other pull loads of salt, fish, grain, machinery, and cement up and down the river. About half the river-borne freight of the USSR is carried on the Volga.

Although we have completed only a small part of our Volga cruise we are already beginning to realize that the different natural zones through which the river flows have all helped make it an important highway for the exchange of the produce of these zones.

The forests of the upper reaches (and especially of the upper reaches of the Kama) are one of the main sources of timber in the USSR and the Volga river system (including the Kama, Vetluga, Vyatka, Unzha and other tributaries) seem to have been devised by nature to carry the wood to treeless regions where millions of cubic feet are transferred to the railway for distribution all over Stalingrad, Saratov, and Astrakhan Regions, to Central Asia and to the Donetz Basin (where large quantities of timber are used in the mines).

The middle and lower reaches of the Volga cross the black earth regions that provide much of the Soviet Union's grain while the lower reaches and the Caspian Sea are rich in fish. The upper reaches of the river run through densely populated districts with large numbers of towns, factory and mine settlements whose populations need the grain, fish, and other produce. The Volga is the connecting link.

And then deposits of various minerals are to be found close to the Volga. Caucasian oil (to say nothing of that in the basin of the Volga itself), excellent marl from which cement is made at Sengilei and Volsk, salt which is obtained from two ends of the Volga system, the upper reaches of the Kama and the salt lakes along the lower reaches where the hot, dry summer makes the evaporation process easier, potassium from the North Urals—these are the chief mineral freights carried up and down the Volga.

At the same time we are already beginning to understand something of the majesty of the Volga as a geographical phenomenon. With its source up amongst the coniferous and mixed forests of the northern zones, its mouth lies in the dry Caspian steppes of the south covering a distance from 57° – 61° to 46° N. Lat., so that the climate conditions of the two “ends” are vastly different. When the mouths of the river are already navigable the ice is just beginning to break up at Kuibyshev while the Kama still sleeps under an unbroken sheet of ice. Nevertheless the water level of the whole system is kept uniform. When the local floods at the mouth are finished water from the upper reaches and from the Kama where the snow is just beginning to melt comes down to take its place. This is why flood time on the middle and lower reaches of the Volga lasts from two to two and a half months. The captain of a vessel that has trouble in crossing a sandbar knows well enough that the level of the water in the Volga depends on the winter snowfall in the Urals region, to the north and even to the west of Moscow; it depends also on the rate at which the snow melts on whether or not the summer is a rainy one in Moscow or Bashkiria. The whole area drained by the Volga is closely connected by invisible geographical threads.

In the heat that we run into south of Kuibyshev we can already feel the hot breath of Asia. If the hot winds from the Transvolga region continue for a long time there is a danger of drought. These winds were once the scourge of the Trans-

volga region and the periodical droughts and famines never allowed the region to grow out of its poverty. Today drought is an enemy that is already more than half beaten. Scientific farming has developed crops that stand up to the droughts, the retention of snow and the better tilling of the land by machinery have made the region less dependent on rains. In many places local rivers are used for irrigation purposes. Irrigation is naturally the most radical measure for protection against droughts and the future projects for the Volga dams will serve to provide both water and cheap electricity for the farms. Part of the energy developed will serve to pump water to the dry Transvolga regions. Lastly, the collective farms maintain insurance funds of grain to provide for their members in the event of natural calamities.

The steamer passes by Volsk, a big cement manufacturing center and ties up at the jetties of Saratov. Saratov is a big, beautiful, bustling city which had 376,000 inhabitants at the time of the last census in 1939; it is an important manufacturing and cultural center. Harvester combines and ball-bearings are amongst the town's most important industries. The University is one of the best on the Volga, and the agronomical institutions are well-known for their research work.

There is a big deposit of natural gas near Saratov which is taken by a pipeline, the longest in the USSR, to Moscow.

Soon we cast off and leave Saratov behind us. The landscape begins to get monotonous, left and right of us are endless stretches of yellow sand and gray reeds; the very width of the river which in places here reaches three miles only serves to heighten the impression of monotony. On the distant left bank we occasionally see the figure of a camel, another sign of the proximity of Asia.

The villages in this region are very large, much larger than those of the upper and middle reaches, but they are a long way apart. Sometimes the steamer passes through unpopulated steppes for hours before some village suddenly comes into sight

around a bend, always, of course with a jetty. The jetties, here and everywhere on the Volga, are floating platforms formed of a huge barge drawn up close to the bank throughout the navigation season. In winter the barge is docked and the banks of the river are bare. It is only in the big towns that there are real quays and "river stations" for passengers in addition to the floating jetties which are sometimes built up to as much as three stories.

VIII. STALINGRAD

OUR ship is drawing near Stalingrad, a city that the whole world knows. From Stalingrad the Red Army did not halt in its victorious forward march until Germany surrendered. It was Stalingrad that made victory certain.

At the time of the Battle of Stalingrad, the Germans who had been thrown back from Moscow the year before were trying to cut across the Volga with a single drive and then advance up stream and capture Moscow from the east thus putting an end to the war. The Russians fought with unparalleled stubbornness for every house, every street, every factory building. Beyond the Volga, where a new railway line and a number of aerodromes were hurriedly built, the Russians concentrated big reserves and on November 19, 1943 assumed the offensive encircling the whole German Stalingrad army under the command of Field Marshal von Paulus from north and south. The German attempt to break the circle from without by transferring large forces from the North Caucasus ended in failure. The ring closed and was gradually squeezed tighter—twenty-two picked German divisions were ruthlessly battered at Stalingrad. The Germans that had besieged the narrow strip of river bank held by the Russians were in turn besieged. The Germans turned the city of Stalingrad into a heap of ruins, ruins that became their graves. The Germans and their allies lost altogether

over 300,000 men at Stalingrad, over 100,000 of whom were taken prisoner. Soviet troops captured rich booty in this battle. Thus Stalingrad became a famous name.

Before the war Stalingrad was a flourishing and rapidly growing industrial city. Between 1926 and 1939 the population was trebled until at the time of the census it was nearly half a million. The pride of Stalingrad was the Tractor Plant, an industrial giant that played so important a role in providing the technical basis for the development of the collective farms throughout the USSR. There were a number of other important engineering enterprises in Stalingrad, several sawmills which handled the timber floated down the Volga, flour mills, grain elevators, extensive wharves, and warehouses. Factories, housing estates, wharves, and parks stretched for nearly thirty miles along the Volga; the center of the city contained a large number of well built and handsomely decorated dwelling houses and public buildings around the huge city square.

During the great Battle of Stalingrad all this was reduced to ruins. The beautiful big blocks of flats, the fine factory buildings with their gleaming glass walls and roofs were nothing but blackened skeletons after the battle. On the territory of the Tractor Plant alone there were 40,000 craters made by aerial bombs and big shells; in the same area Soviet sappers removed 10,000 mines and cleared away the bodies of 4,000 dead Germans. The people returned to Stalingrad and began rebuilding their houses to provide shelter, their communal enterprises so that they might have water, light, and bread and their factories so that they might provide the things so badly needed at the front.

With the help of the whole country the Stalingraders set to work enthusiastically to rebuild their city. Within six months the Stalingrad factories sent the first trainload of repaired tanks to the front. In 1944 alone 12,000 houses were rebuilt. On June 17, 1944 the Tractor Plant produced its first tractor. The heroism displayed by the Stalingraders in battle and the equally selfless

heroism of their work to rebuild the city won the admiration of the whole world. King George VI of Great Britain sent the city a sword of honor forged by the best British craftsmen. Stalingrad will return to its former glory in a very short space of time.

Stalingrad stands on that bend of the Volga which is closest to the Don. This is an important factor in its future development. If these two great rivers are joined by the canal that has been dreamed of since the time of Peter the Great the Volga will have direct access to the Sea of Azov and the Black Sea. This canal is to be built at Stalingrad and will connect the Volga with the rich Cossack lands. Timber from the Volga will go to the Donetsk Basin by water and Donetsk coal will go back to the Volga. The Don will carry vessels down to the famous town of Rostov which stands almost at the mouth of the river near the Sea of Azov. Rostov is a seaport with important manufactures, mostly engineering and food processing. The biggest of the newly-built enterprises is the farm machinery works which occupies a huge territory just outside the city.

Rostov is an important transport center lying on the shortest route between Moscow and the Caucasus. Its development like that of Stalingrad, is due to the proximity of the iron and coal of the Donetsk Basin.

In their efforts to reach the Caucasus the Germans twice captured Rostov which, like Stalingrad, was very badly damaged.

The lower reaches of the Volga from Stalingrad to Astrakhan flow through what is mostly uncultivated land; yellow sand and salt marsh take the place of black and brown earth. The Volga now splits into a number of streams forming a long delta with a tortuous labyrinth of backwaters overgrown with reeds and willows. These backwaters are full of all kinds of fish. One of the backwaters, the Akhtub, flows parallel to the Volga for a distance of about 350 miles. A birds-eye view would show us the long narrow green strip of the delta floodlands in a huge ex-

panse of desert waste in which there are occasional salt lakes.

At the very end of the Volga stands Astrakhan, a big brightly colored, semi-Asiatic town. The surrounding arid regions fill the town with dust and heat; on the streets one frequently meets Kazakhs in their long robes and Caucasian mountaineers in tall fur caps. Carts are to be seen drawn by camels. At the wharves which run the whole length of the town there is a strange mixture of vessels—big Volga steamers, barges of every possible type, fishing vessels, sea-going steamers, motor boats and the sealers' boats. Fishing is the chief industry of Astrakhan; the fish caught in the lower reaches of the Volga and in the Caspian are packed right here in the biggest fishing center in the USSR. The crews of the vessels that ply the Volga and the Caspian have their homes and their families in Astrakhan; other inhabitants of Astrakhan are the workers and engineers of the shipyards, the crews that transfer huge quantities of oil from the Caspian tankers to the Volga barges. The transfer of the oil takes place out at sea in what are known locally as the "twelve-foot roads" where there is a whole oiltown anchored. The Volga deposits such a large quantity of silt around its mouth that the big Caspian tankers cannot come close up to the city. The twelve-foot roads are linked with Astrakhan by an artificial fairway kept clear by constant dredging.

At Astrakhan we leave the steamer that has been our home for a whole week and transfer to a sea-going vessel to continue our journey across the Caspian to the Caucasus.

IX. THE WORLD'S LARGEST LAKE

THE Caspian is called a sea out of respect for its size; it is bigger than the Black Sea, about the same size as the Baltic and Red Seas and almost as large as the Mediterranean. Although it is the largest lake in the world fed by the largest European river it is not a sea because it has no outlet to an ocean. Its salinity is slightly greater than that of other seas and oceans, its color

is that of the sea and its fauna, although possessing certain peculiarities is, in general, a regular sea fauna. Its great depth also gives it right to be called a sea—the southern part is well over 3,000 feet deep. In the autumn and winter there are terrific storms on the Caspian so that only regular sea-going vessels are in use. On one of these we shall make our trip to Baku.

CASPIAN SEA

Area: 169,381 sq. miles.

Level: 85 feet below the level of the ocean.

Greatest depth: 3600 feet.

Washes the USSR (R.S.F.S.R., Kazakh S.S.R., Azerbaijan S.S.R., Turkmenian S.S.R.) and Iran.

Chief ports: Astrakhan, Baku, Krasnovodsk, Makhach-Kala, Guryev, Lenkoran, and Derbent (USSR); Pehlevi and Bender Shah (Iran).

Economy: shipping (especially oil), fishing and sealing.

The northern part of the Caspian is frozen in winter.

The vessel leaves the port of Astrakhan and crosses the northern part of the Caspian where there is fish of many kinds in abundance, including the most valuable varieties of sturgeon. The fish are attracted by the shallow waters that are suitable for breeding and provide ample food. The right to catch sturgeon and other high-class fish once belonged exclusively to the runaway serfs—Cossacks—who escaped from Muscovy in the sixteenth century and settled at Astrakhan; the tsarist government gave the Urals Cossack Army monopoly rights to the fish of the Volga system of rivers as a reward for services rendered in guarding the frontiers. At that time the favorite sport of the Cossacks, whose handling of a boat amongst the islands of the Caspian was as daring as their horsemanship in the steppes, was swan hunting. The hunts took place in the moulting season when the swans could only escape by swimming. It was no easy job to chase swimming swans in a rowing boat. When the swans were overtaken they were hauled on board with a boathook.

Today the whole of the huge bay which forms the northern part of the Caspian is covered with all kinds of fishing vessels from schooners to motor boats. Fishing goes on summer and winter even when the sea is ice-bound. Fishing under the ice is both difficult and dangerous. As the Caspian lies at a very low latitude the ice is due only to the extreme continental climate and is never very safe. The ice breaks when there are strong winds from the north and the ice floes often carry whole groups of fishermen out to sea. Special lifeboats are maintained to rescue them.

The northern part of the Caspian provides the greater part of the total catch of black caviare, a delicacy that is famous throughout the whole world.

Another important factor in Caspian economy is the seal. This animal is not found anywhere else in the northern hemisphere at such latitudes. Nevertheless the Caspian provides almost half the annual catch of seals in the USSR.

The mouth of the Volga is far astern but the Caspian is still almost saltless so great is the amount of water poured into it by the river. Every year a layer of water nearly three and a half feet thick is evaporated from the surface of the Caspian. Some seventy per cent of this loss is made good by the Volga.

Huge tankers carrying oil from Baku and Grozny pass us on their way northwards reminding us that we are traveling the "Great Oil Route" and that soon we shall see the center of the Soviet oil industry, the Apsheron Peninsula on which Baku stands.

On our right we pass the Caucasian ports of Makhach-Kala and Derbent in the Daghestan A.S.S.R., one of the autonomous republics of the North Caucasus. Makhach-Kala, formerly known as Petrovsk in memory of Peter the Great's Daghestan campaign, is the capital of the republic whose population (about 2,000,000) consists of a large number of related highland tribes—Lesgins, Avars, Darghins, Laks, and many others. There is a pipeline from Grozny, the main oil center in the North Caucasus

to Makhach-Kala where the oil is taken on board tankers for transport to the Volga. In Soviet times a considerable engineering industry has grown up in Makhach-Kala. Near Derbent there is a big glass works that is run on natural gas.

Daghestan is a mountainous country with a landscape that is stern and wild. Rocks, mostly of dark tones, tiny mountain pastures, dry valleys where the farmlands need artificial irrigation—such is the country. For many years now this inhospitable landscape has been undergoing many changes: extensive irrigation works have been undertaken, small and medium sized power stations have been built on the mountain rivers, and the use of the valley and mountain pastures has been developed on a planned basis to improve the animal husbandry that still forms an important part of agricultural life in the republic. Fruit and grape growing have been extensively developed and fruit preserving and wine-making have been introduced. An important role in this economic development is naturally played by the republic's national autonomy; Daghestan has become a single political unit and despite its many different tribes is able to settle all questions of cultural and political progress. The many tribes and their differences put obstacles in the way of cultural development. In Daghestan today there are schools teaching in seven different languages to say nothing of the different dialects that many of them use. Some of the nationalities of Daghestan had to develop an alphabet and a literary language. The peoples of Daghestan who were formerly the most backward in the Caucasus and who retained the most barbaric customs of the blood feud, who were constantly at war with one another over the mountain pastures and herds, that had been stolen in ancient times, are now acquiring culture and are working peacefully together in the economic field. The successes are no less astounding than those we saw on the Volga.

We have passed other ports on our left—Shevchenko on the Mangyshlak Peninsula, named after the talented Ukrainian poet who was exiled to this place about 100 years ago for his politi-

cal poems, and Krasnovodsk. The eastern coast of the Caspian belongs to the Kazakh and Turkmenian republics which we shall visit later.

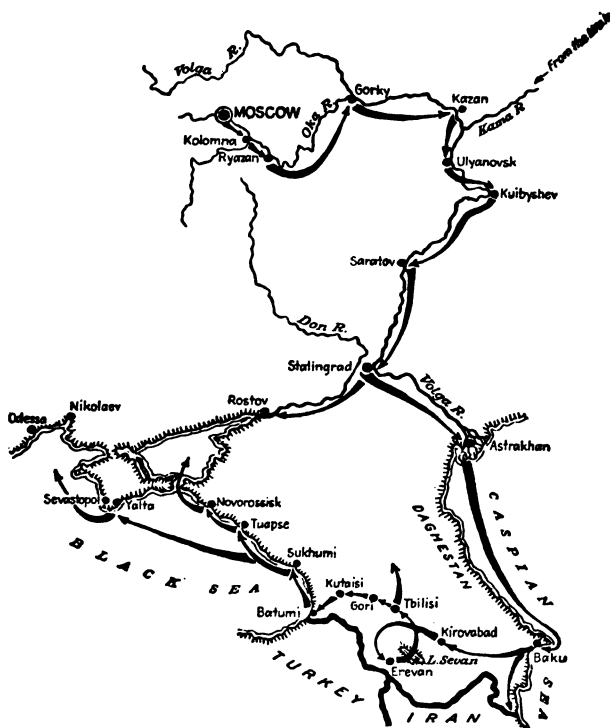
X. THE OIL CITY

Our first glimpse of Apsheron is a number of low, dry, grayish clay hills, the farthest spurs of the Caucasus, bare except for a few green patches; the long peninsula juts out into the Caspian like the beak of a bird pecking at the water. On the coast we pass small groups of houses, summer cottages and villages; near them are gardens that have been developed with great skill and artifice in that waterless region. We pass Artem Island (It is no longer really an island as it is now connected with the mainland by a dam), turn round Cape Shah at the extreme end of the peninsula and come into full view of the southern side of Baku Bay. A whole forest of oil derricks stretches along the banks and deep into the peninsula. In the center of this forest lies the city of Baku.

An excellent boulevard runs along the sea front from the harbor; an asphalt road between avenues of palm trees takes us away from the ship to the city.

The Baku landscape has a peculiar beauty of its own. Low hills form an amphitheater around the bay and the city rises gradually from the sea coast on their slopes. At the top is the Hill Park which some of the best Soviet architects and landscape gardeners spent several years in laying out. From the park we get a wonderful view of the bay with vessels in the harbor and lying out in the roads and with the whole city spread out at our feet. The old center of the city—the Baku Fortress—is a mass of little houses with flat roofs, the minarets of mosques and narrow crooked streets looking just like the stage set for an oriental opera. In the same section are the seventeenth-century Palace of the Khan and the “Tower of the Virgin,” an old fortification of which many legends are told. The tower is a

relic of the times when Baku was the residence of the Khans who ruled under the overlordship of the Shah of Persia. This tiny fortress is completely lost amongst the huge blocks of elegant, European-type flats and wide straight streets, boule-



wards, and gardens. It is like a graphic illustration of life in the Middle Ages and today, all drawn to scale. Beyond the boundaries of the city itself there are endless "oiltowns," communities inhabited by the workers of the various oilfields. This Greater Baku is almost half the Apsheron Peninsula.

An electric train takes us from the center of Baku to the oil-

fields. This was the first electric railway in the Soviet Union, built in 1925 when the oil industry was being rehabilitated after the ruins caused by the Civil War. Before this a crawling steam train was the only link between the city and the oil settlements; the settlements themselves have also undergone very considerable changes since that time.

After we leave the Baku station, a big oriental building in the very center of the city, we see oil derricks on all sides. There are many thousands of them on the peninsula and the output of oil has considerably increased in Soviet times; over three and a half times the pre-revolutionary quantity of oil is now extracted. Although there are now other oil regions in the USSR—you will remember we passed through one of them, "Second Baku"—and although the extraction of oil at Grozny, Maikop, and other smaller oilfields has been greatly increased, Baku still holds first place in the USSR's oil budget.

When the oilfields belonged to private companies—Nobel, Mantashev, Lianozov and others, the division of the oil territory into narrow strips had an adverse effect on the exploitation of the wells. The wells were not drilled at the most advantageous points from a geological point of view, but along the boundaries of the territory so that they could pump out the oil of the neighboring field. There was no common pipeline or railway system; the whole exploitation of the field was wasteful and gushers were at a premium. This did a lot of damage to the field and the lower oil levels were frequently flooded with water. Every firm kept its drilling data a strict secret for, paradoxical as it may seem, the Apsheron Peninsula was very poorly surveyed geologically, despite its dense forest of oil derricks. In the hands of the Soviet State the Apsheron Peninsula is one huge oil concern, it has been thoroughly surveyed so that the nature of the earth is an open book to those who run the oil industry. Deep deposits of oil whose very existence was formerly unknown are now being worked. The old fields (Sabunchi, Surakhany, Bibi-Eibat, Bailov, and others) are still worked and

such new fields as Zyk, Lokbatan and Kala have been opened up in Soviet times. The bed of the sea has been drilled for oil at many places near Baku. Huge deposits of earth have been unloaded on to the seabed in a number of places and derricks erected on the artificial islands thus formed. The Ilich oil field at Bibi-Eibat was built in this way.

The geological survey of the whole Transcaucasus region has carried the oilfields far beyond the boundaries of the Apsheron Peninsula (near Alyaty, at the mouth of the Kura River, in Eastern Georgia and other places).

In the old days oil was baled out of the wells (they were not very deep, of course) with long buckets that opened at the bottom to let out the oil. Today pumps and compressors have taken the place of buckets.

At first sight it seems that there are no workers in the fields. The pumps at the wells hum merrily, one electric motor being coupled to several pumps, the whole being regulated automatically. A worker walks round occasionally examining the pumps at work. The Baku oilfield is one of the most highly mechanized in the world.

There are no longer the oil lakes into which the oil from the wells, especially the gushers, was directed in the old days. Large quantities of valuable petrol evaporated from the black oily surface of these lakes. The whole of the present workings is hermetically sealed and there is no oil to be seen anywhere; it leaves the wells in pipes and is loaded straight on to tankers in the port or into the reservoirs of the refineries. The refineries with their distinctive rows of squat round oil reservoirs stretch for many miles and give a special character to the landscape of two of Baku's suburbs—Blacktown and Whitetown. In Soviet times the refining of petroleum at the oilfields has been widely developed and the purpose of the refining has changed; formerly the petroleum was refined for the purpose of obtaining as much kerosene as possible whereas today the object is to obtain the maximum amount of petrol from every gallon of crude oil.

The extension of the oil refineries and the introduction of new cracking plants have resulted in a fifty per cent increase in petrol production since the Revolution.

Large engineering works serve the needs of the oil industry while there are also shipbuilding and repair yards for the oil fleet. In addition to the industries that are directly connected with oil there are very considerable textile, clothing, and food processing industries in Baku. A new industrial center has sprung up at Sumganty, on the northern coast of Apsheron not very far from Baku.

Baku has a mild winter, snow rarely falls and the sea does not freeze; the summer, however, is hot and dry and is hard on people coming from the north. The winds, especially those blowing from the north often reach hurricane strength. The old Persian name for Baku was Bad-Kube which means a blow of the wind. The north winds blow through the bare hills of the Apsheron Peninsula and carry clouds of sand and dust into the city. A strong, prolonged north wind makes the city very uncomfortable. The people wear dust glasses, you see the militia men on traffic control at the cross-roads wearing them and you even see them on horses in the streets. There is one comfort, however; the north winds drive the film of oil that lies on the sea far away from the shore. When a seawind blows the oil is massed near the shore and few people will risk bathing in it.

If trees were planted on the Apsheron Peninsula the sands would be consolidated and less would blow into the town. The difficulty is lack of water, for here it is easier to find oil than water. The city itself formerly suffered badly from the water shortage when drinking water was brought in tankers from the mouth of the Kura River. It was not until 1917 that good drinking water was brought to Baku from the mountain over a pipeline about 120 miles long. Still there is not enough water to irrigate the dry, dusty Apsheron Peninsula; the problem will be solved by the Samur-Divichi Canal. In places which the water has already reached orchards have developed rapidly, and sum-

mer cottages and sanatoria have been built amidst abundant greenery. The irrigation of Apsheron will improve the supply to the huge population of Baku (at the time of the 1939 census it was over 800,000, today it is probably nearer a million) of fresh milk, vegetables, and fruits.

Baku is an ancient city. The route between the Asian east and Russia at one time ran along the shores of the Caspian: communication with the Mediterranean countries was maintained through the valley of the Kura. In 1223 the Mongols invaded Russia through Azerbaijan. Constant wars and raids, the Asian despotism of the provincial khans gradually turned Azerbaijan into a poverty-stricken and forgotten province and Baku, the capital of one of these small Khanates became a miserable little town. The situation did not change immediately after Azerbaijan was annexed to Russia (1828). The founding of the oil industry in the seventies of the nineteenth century brought about a rapid development of Baku and by the beginning of the present century the Baku oil concerns made up what was almost the biggest industry in Russia: they provided about a half the world's oil supply. Almost all the oil workers of Baku came from other parts of the country and were of different nationalities. Highly skilled workers already hardened in the class struggle came from Central Russia, the laborers, Azerbaijanians, and other Caucasian peoples, came direct from remote villages. In this multinational atmosphere the class struggle soon developed. The concentration of so much industry was an incentive for the workers to unite but they were hindered by their national prejudices. The Bolshevik leaders were the inspirers of working class unity in the trade union and political struggle; they gained considerable authority amongst the Baku workers at a very early date. One of the prominent leaders at that time was the young Stalin.

Since 1920 Baku has been the capital of the Azerbaijan S.S.R., the biggest of the three Transcaucasian constituent republics of the USSR.

XI. INTO THE MOUNTAINS

AZERBAIJAN has a very varied landscape which includes the stony mountains of the Main Caucasian Range, separating Azerbaijan from Daghestan, the highest of which is Mount Bazar-Diuzi (14,800 feet), and the densely wooded, picturesque spurs of the Little Caucasian Range in the southwestern region of the republic, the pastures of the Karabash Highlands (8200–10,000 feet) and the dry steppes of Mugan and Shervan; we have already visited the grayish clay hills of Apsheron.

AZERBAIJAN S.S.R.

Area: 32,800 square miles.

Population: 3,200,000 (1939). The majority are Azerbaijanians, there are many Russians and Armenians and some highlanders of the Daghestan group.

Neighbors: Daghestan (R.S.F.S.R.) in north, Georgian S.S.R. in west, Armenian S.S.R. in southwest, Iran in south.

Relief: Mountains (Main and Little Caucasus Ranges), their slopes and a flat plain. Highest point Mount Bazar-Diuzi 14,800 ft.

Chief Rivers: Kura (950 miles) and its tributary Arax.

Region of Russia since 1828.

Soviet Azerbaijan established 1920.

Autonomous Regions: Nakhichevan A.S.S.R. (capital Nakhichevan on the Arax River) and Highland Karabakh Autonomous Region (capital Stepanokert).

Produce: petroleum, iron and copper ore, cotton, grapes, wool, fish.

Capital: Baku.

The jungles of hot Lenkoran form an interesting corner of the republic. They lie to the south of Baku around the mouth of the Kura River right on the frontiers of Iran. The Lenkoran lowlands run along the Caspian sea and are cut off from the Transcaucasian Highlands by the Talysh Hills. This is a wet

subtropical region. The sea has built up a high ridge all along the coast and between this ridge and the mountains considerable moisture is caught. Here swamps have been formed with real jungles of high reeds. Higher up, on the slopes of the hills there are dense impenetrable forests closely intertwined with lianas. The zebu, usually associated with India, is the common domestic animal of Lenkoran.

During recent years such subtropical crops as tea, tangerines, lemons, and bamboo have been introduced; tea processing plants have been built and figs, pomegranates, and feijoa grow in the orchards. The swamps are being drained.

Our itinerary, however, does not pass through Lenkoran but westwards into the depths of the Transcaucasus.

From Baku the railway follows the valley of the Kura. This valley is a hot, waterless plain. In the autumns the herds belonging to the state and collective farms come down into the valley from the mountain pastures and shearing and slaughtering begins. There is little snow in the winter and the cattle are fed on the hoof. The farmers maintain special stocks of hay to supplement the winter feed. In spring the cattle are again driven to the mountain pastures or *eilag*, as they are called locally. The winter pastures in the plains are called *kishlag*.

Cotton is planted along the Kura and along the lower reaches of its tributary, the Arax, on lands irrigated artificially. This district grows the best sorts of Egyptian cotton whose long silky staple makes a stronger thread than the American-type cottons. So far only part of these fertile but dry steppelands are planted to cotton.

At the town of Mingechaur, near Yevlakh, the Kura River races through a narrow gorge before entering the plain. Nature seems to have designed this gorge as the site of a high dam and a power station. Work on the construction of the dam was begun as soon as the war ended and the water which it impounds will be diverted down a long canal to irrigate hundreds

of thousands of acres. The current produced by the Mingechaur Hydro-Electric Station will help supply Baku and other industrial centers in the Transcaucasus.

The railway carries us past Yevlakh, westwards, to a more mountainous part of Azerbaijan. We run into the big industrial city of Kirovabad which the Azerbaijanians formerly called Ganja and the Russians Elizavetpol. Although Kirovabad has become a big industrial center in Soviet times it has still preserved its pleasant, homely appearance. There is a beautiful park in the city, its ancient streets are planted with aged poplars and clear cold water from the mountain streams runs along them in open stone-lined gullies. It is not as hot here as it is in Baku, but all plant life is nevertheless in need of water; the pedestrian on a hot summer day is also only too willing to avail himself of the cold water which he dips up with an ancient bowl from stone basins at the street crossings. Naturally, the new buildings belonging to the modern Kirovabad industries have made some difference to the old patriarchal aspect of the town; big apartment houses have appeared amongst the little old houses in their own gardens, there are more people and more noise but the specific local color is still the same.

The chief industries in Kirovabad are the cotton goods and cloth mills where large numbers of women, but recently freed from the veil, now tend the machines.

The first textile mill in Kirovabad was brought there *in toto* from Tambov in Central Russia in the first years of Soviet power for the purpose of giving an impetus to the industrial development of Azerbaijan which at that time was, with the exception of Baku, a very backward region.

The environs of Kirovabad are very picturesque: there are extensive vineyards stretching right up to the town. These vineyards produce the best desert grapes in the Transcaucasus—Elizavetpolsky and Lady's Fingers. Beyond the vineyards there are well wooded hills. Near the beautiful Lake Gyol-Gyol which is surrounded by overhanging cliffs of rosy-hued stone there is

a big game reserve where bear, antelope, and wild hogs live without fear of the hunter. All bird and animal life of the Little Caucasus is represented in this reserve.

South of Kirovabad there is a comparatively small territory amongst the spurs of the Shahdag Mountains, which separate Azerbaijan from Armenia where many and varied minerals are located. Some of them are already being worked. The most important is the Dashkesan iron ore; there are also valuable copper deposits.

North of the Kura Valley and Kirovabad, in the foothills of the Greater Caucasus Range and well protected from the north winds there are rich orchards, vineyards, and groves of walnut and mulberry trees. The cocoons from the worms that feed on the mulberries were formerly exported in the raw state; today there are a number of silk mills, especially in the town of Nukha, which handle the cocoons on the spot. In Kube and other towns carpets are the speciality. Nukha, Kube, Zakataly, and other provincial towns in this region closely resemble Kirovabad in miniature.

In the southwestern part of Azerbaijan there is the Highland Karabakh Autonomous Region. This is a separate autonomous unit set up in accordance with the Soviet principle of giving every nationality the fullest opportunities for developing its own culture and using its own language. The majority of the population of Karabakh are Armenians and not Azerbaijanians. The capital of the region, Stepanokert, may be reached from Yevlakh by a motor road running through the mountains.

As its name implies Highland Karabakh is a land of mountains. The landscape is divided into vertical zones as throughout the Caucasus: the lowest zone consists of orchards, vineyards, and mulberry groves, higher up the mountain slopes come to forests, still higher the summer pastures—*eilags*—where the cattle are driven every spring and where they remain until autumn.

The cattle drive is an important event in the lives of the population. Various measures, such as veterinary control, have

been introduced to regulate these annual movements of the cattle and sheep.

Beyond the mountain ranges that form the border of Highland Karabakh in the southwest lies the second Transcaucasian republic, Soviet Armenia. The mountain passes connecting Karabakh with Armenia are extremely difficult hence the inclusion of the region with its predominantly Armenian population in the Azerbaijan Republic and not in Armenia. In order to reach Armenia, therefore, we shall have to return to Yevlakh and make the rail journey through Kirovabad to Eastern Georgia where the railway to Erevan, the Armenian capital begins.

We are now taking leave of Azerbaijan after having seen its most interesting features. One thing we cannot fail to notice is the absence of that irregular development which was characteristic of the region in the past when Baku was a comparatively highly developed capitalist city, an island in an ocean of backward villages and provincial towns untouched by industry.

Cultural achievements have been equally great as a few figures will show us. In the schools of the present Azerbaijan in 1914 there were 73,000 children; today there are over 500,000. Naturally literacy is more widespread. In 1926 only twenty-five per cent of the population could read and write, in 1939 the figure was seventy-three per cent. The greatest feat has been the education of the women who were formerly doomed to life in the seraglios. The modern Azerbaijan woman has unveiled her face, she takes an active part in political life, she works in the new industrial enterprises and there are many Azerbaijan women doctors, teachers, engineers and actresses. In modern Azerbaijan there are fourteen higher educational establishments (most of them in Baku) and over sixty scientific research institutions. In 1945 the Affiliate of the Academy of Sciences of the USSR was reconstituted as the Azerbaijan Academy of Sciences. The work of the scientists of this academy are well known to the scientific world.

XII. AT THE FOOT OF MOUNT ARARAT

ENTERING Armenia from Georgia the train climbs to a very considerable height up the mountains. The traveler does not usually notice this climb as it is made at night. His organism, however, may take account of the rarer atmosphere. When he wakes up in the morning he is struck by the apparent transparency of this dry, rarified air which shows him every tiny detail on the plateau, spread out before him. This plateau is dominated by the snowcapped Mount Alagez (the Armenian name is Aragats) which we see on our left. Its height is 13,500 feet.

ARMENIAN S.S.R.

Area: 11,500 square miles.

Population: 1,300,000 (1939), predominantly Armenians.

Neighbors: North, Georgian S.S.R., east, Azerbaijan S.S.R., west, Turkey, south, Iran.

Relief: High mountains with many separate peaks and mountain chains.

Chief rivers: Arax, Zanga, (Lake Sevan, a mountain lake over half a square mile in area).

Region of Russia since 1828.

Soviet Armenia established 1920.

Produce: building stones (volcanic), copper, cotton, grapes, wool.

Capital: Erevan.

Almost the whole of Armenia lies amongst high stony mountains: these mountains are not much lower than the Greater Caucasus. Dozens of peaks and whole ranges are over 10,000 feet above sea level. The visitor gets the idea that the Armenian mountains are not high because they are bare; Armenia has a severe continental climate as it is cut off from the sea by high mountains and borders on the hot valleys of Iran and Turkey.

There are very few snowcaps on the mountains and the majority of them are devoid of trees.

The train enters the valley of the Arax where we see the first big Armenian town, Leninakan (it was formerly called Alexandropol), second in size only to the capital. In Soviet times Leninakan has developed into an important manufacturing town with textile and chemical plants and a food processing industry that are supplied with electric power by the near-by Dzora Hydro-Electric Power Station.

From Leninakan we turn south. From now on the sun is scarcely ever hidden behind the clouds. Intense bright light and heat pour down on the grayish-yellow stone-strewn earth with its dry grass and occasional shrubs. To our right we can see the huge Mount Ararat (in Armenian—Masis). We soon begin to feel the heat.

Armenia is a land of stone. We are reminded of this by the conical silhouettes of the ancient Armenian churches which show us from afar where the villages are hidden amongst groups of trees. Building in stone had reached a high stage of development in Armenia many centuries ago and nature has given the Armenian people a larger selection of different types of materials for building.

Historically Armenia is a very ancient country. At one time this was the land of Urarty, the oldest state on the territory of the USSR; Armenia fought against Rome under King Tigran the Great several centuries B.C. and a thousand years before the Russian state was founded. Geologists, however, call Armenia a young country where there are today still many earthquakes (Leninakan suffered badly from one not long ago), and where many volcanoes were active "yesterday." It was these volcanoes that gave Armenia her unique collection of building materials. The cooled lava and the produce of the eruptions—porous tuff and pumice stone, basalt and spars—are all materials that can be polished, sawn, and carved and converted into magnificent portals and wonderful stone lacework.

We shall see many wonderful architectural monuments, churches known to art historians and archeologists as some of the oldest Christian buildings in the world.

Amongst them is the ancient monastery of Echmiadzin known to Armenians all over the world, in Syria, in Iran, and the U.S.A. Echmiadzin is still in existence as a proof that the spiritual life of the Armenians, despite all the vicissitudes of the nation, has developed continuously to our days. The ancient monastery of Echmiadzin is still today the residence of the Catholicos who heads the Armenian church. During the Second World War the Armenian Church sent out an appeal to all Armenians to help the government of the USSR and the Red Army against the Hitlerites; this appeal had a world-wide reverberation amongst the Armenians living outside the Soviet Union.

Entering the monastery through wide gates in the high stone wall, we find ourselves in a shady garden. Before us stands the Echmiadzin Cathedral, a massive cube surmounted by a faceted cone on a simple cylinder. Centuries of tradition in ecclesiastical architecture produced canons of simplicity and great harmony of proportion. The traveler never tires of looking at the Echmiadzin Cathedral both close up and from afar; the close up view shows him the breath-taking beauty of the pierced stone carving around the church portals.

The buildings around the Cathedral form a perfect architectural ensemble; they are the Echmiadzin library, the residence of the Catholicos and a long two-storey building for the monks with a gallery around the top floor. The sudden transition from the heat of the valley and the sunbathed houses and narrow streets of the township of Vagarshapat that has grown up around the monastery to the simple luxury of the shady garden and ancient stones leaves an indelible impression on the visitor.

The Armenian plateau is between 5,000 and 7,000 feet above sea level. The Valley of the Arax, where we are at present, is about 3,000 feet. It is hot and dry in the valley and in August

the average temperature is about 80° despite the fact that the continental climate gives cool nights. The rainfall is only about 12" a year, which is insufficient for vegetation. Where we see patches of green vegetation, orchards and vineyards, green corn-fields, cotton plantations, sugar-beet fields, and olive groves, we know that the great industry of man has brought water to the earth through a network of tiny canals. The artificially irrigated lands are mostly in western Armenia, the lowest part of the country (along the Arax Valley) to which our journey has so far been confined. There is greater need for irrigation here than elsewhere and it is also the part of Armenia that has been most densely populated since early times. In Soviet times the area of the irrigated lands has been more than quadrupled and the work is still continuing. Today about 500,000 acres are irrigated. The intensity of the farming in this region arouses in us deep respect for the thousands of years of human labour that have made flourishing gardens in this sun-baked stony soil.

Higher up in the foothills it is cooler and moister, there is excellent grass and the farms do not need artificial irrigation. Still higher (at about 6,000 feet) there are the wonderful Armenian Alpine pastures where the cattle from the plain spend the summer.

The sun that dried up the Armenian plains is the country's greatest treasure. Wherever man has brought water to the earth, the sun has rewarded his toil with rich harvests of the most valuable crops. There is sun in the wines and brandies of Armenia that come from the grapes grown on the mountain slopes. Together with the water the sun gives life to extensive plantations of cotton, tobacco, castor oil, jute, and other warm-weather plants. There is sun in the fruits that ripen in the Armenian orchards.

There is also great wealth in the earth. We have already seen something of the great variety of building stones. The tuff stone from Artyk is so valuable that it is transported to Tiflis and even to Moscow. Pumice, lithographic stone, and marble, are also ex-

ported to other Soviet republics. There are also copper (at Alaverdy, Zangezur) and several other metals. Plants smelting copper and refining the complex metal ores of Armenia, have been well developed in Soviet times.

The Arax valley has remained the center of the fruit-growing, wine-making, and cotton industries; the centers are the little towns of Oktember, and Kamarlu, and the railway junction of Ulukhanlu. The next stage of our trip is by motor road from Echmiadzin to Erevan, the capital of Armenia. Throughout the whole of this journey we keep in view the white snowcap of Mount Ararat. Even when it is behind us we seem to feel it physically and we realize why the mountain has become the national symbol of Armenia and forms part of the coat of arms of the Armenian Soviet Socialist Republic.

XIII. THE CAPITAL OF ARMENIA

THE suburban housing estates and orchards are behind us, the train has crossed the River Zanga and is now standing at the terminal station in the heart of Armenia, the city of Erevan.

At one time this was a town of mud houses, the residence of the Turkish Pasha who governed Armenia. After 1828, when the greater part of Armenia was liberated from the Turkish yoke by Russia it became a distant provincial town differing very little from a large village. A mass of small flat-roofed houses filled a depression in the vicinity of the Zanga River. In modern Erevan almost all the old residential quarters have been replaced by new blocks of apartment houses in which architects and builders have preserved the traditions of ancient Armenian architecture. One of the finest of the new buildings is the theater. Wide asphalted streets have been laid down and shady boulevards constructed. New water mains and a drainage system have been built and there are trams in the Erevan streets. The depression soon became too small for the city which has spread on to the cooler Plateau of Nor. The basic plan for the reconstruction of

the city was that drawn up by Tamanyan, a talented Armenian architect but considerable changes had to be made in it as the city grew much more rapidly than was anticipated.

Erevan today is a big city with a population of over 200,000 (1939). In addition to being the capital it is the industrial center of the republic with textile, chemical, and engineering industries and wine and brandy plants. There are also a number of food processing plants. Before the Revolution Erevan contained one single factory of the cottage industry type distilling brandy; today Erevan industries turn out such intricate products as synthetic rubber and power station equipment. The city is also the biggest cultural center of Armenia; many of the city's scientific and cultural institutions are of all-Union importance. The work of the scholars on questions concerning the history, language, and art of Armenia make Erevan a cultural center for the many Armenians living outside the Soviet Union.

In Erevan there is the Armenian Academy of Sciences which was established a few years ago and a number of research institutes some of which, like the Tropical Institute, are of first rate importance. The museums and libraries of Erevan have unique collections of Armenian antiquities gathered from all parts of the country; from Echmiadzin alone 10,000 ancient Armenian manuscripts were recently sent to the city. The manuscripts are ornamented with wonderful miniatures and apart from their artistic value they are an invaluable source of knowledge of the manners and customs of past times. There are some ten higher educational establishments in Erevan training specialists for various professions.

The city has changed beyond recognition, only old Mount Ararat itself remains unchanged, the dominating feature of the landscape. The nearness of Ararat, incidentally is an optical illusion for it is actually nearly forty miles away; the air is so pure and transparent that it seems much nearer. Ararat can be seen from every street and square of the city.

Soviet Armenia and its achievements have attracted the atten-

tion of Armenians living outside the USSR. The centuries of misfortune and the ancient enmity shown the small handful of Armenian Christians by the one-time powerful Moslem rulers of the Ottoman Empire and of Persia sent Armenians to all parts of the Near and Middle East. You will find Armenians today in Cyrenaica and Greece, in Syria and the Iranian cities, in Cairo and Smyrna and there are Armenian colonies in the U.S.A. This scattering of Armenians to the four corners of the earth was due mostly to the fact that they had no state of their own. The work of studying the past of Armenia, its language, literature, antiquities, and monuments makes Erevan an important international center. Many Armenians living in various parts of the world are attracted by the idea of returning to their native land and as a consequence there has been considerable immigration. In the country districts around Erevan you may meet a peasant who speaks perfect French; he came here from Syria. The Armenian government provides immigrants with plots of land or finds them jobs in the new factories or research institutes in accordance with their professions.

XIV. ONE AND A HALF BILLION CUBIC FEET OF WATER

THE wealth of Armenia lies not only in the sun and her stone—the rivers play an important role in the country's economy. Armenia is really short of water: there are few rivers but they carry a huge volume of water. As they race down from the mountains they develop tremendous power so that modern Armenia has become a republic of electricity supplied by its mountain streams.

We are now going to visit one of the biggest hydraulic engineering jobs in the Armenian Republic based on a bold and clever technical plan. This construction job consists of a number of sections, the last of which is close to Erevan itself. The whole series of power stations is known as the Sevan-Zanga Cascade.

If we leave Erevan by motor road to the northeast we follow the Zanga River. The road takes us higher and higher and all the time the Zanga comes roaring merrily down from above to meet us. Some 45 miles from the city we reach the source of the Zanga which flows out of the huge Lake Sevan¹ (above 550 square miles in area); the lake is situated 6,350 feet above sea level. There are few lakes of this size to be found at such an altitude anywhere else in the world. Lake Sevan occupies a huge depression and the mountains surrounding it stretch away in the far distance for the lake is 45 miles long and 24 miles across at its widest; these mountains seem like low hills beside the lake. The water in the lake is blue and transparent and is well stocked with big mountain trout. The supplies of water that nature herself has raised to a height of nearly 3,000 feet above the city of Erevan are exceptionally large—1,579,000 million cubic feet of water. The only outlet from the lake is the Zanga River and nine-tenths of the water that reaches the lake from the surrounding mountains evaporates into the air. Every year nearly 18,000 million cubic feet of water are lost that could be used to perform valuable work. Scientists and engineers have decided to increase the flow of water in the Zanga and turn the river in a cascade of hydro-electric power stations. At the same time this work will serve to irrigate valuable farmlands along the river. When the area of the lake is reduced (it is estimated that the level of the water will drop 180 feet in the next fifty years which will give it an area of something between one-tenth and one-seventh of the present area), the evaporation will be reduced and after that the cascade will use up only the water which flows into the lake from the mountain streams. Work on the project began in 1930 and the first power station has been built and is producing current. Work on the other sections of the cascade is now under way. In order to increase the flow of

¹ The word Sevan (or Sevank) means "Black Monastery" in Armenian. The lake got its name from an old monastery on a tiny island

in the north-western part of the lake. The monastery was abandoned for a long time but has now been equipped as a rest home.

water into the Zanga (this will also increase the capacity of the existing stations on the river), a tunnel nearly four miles long and over 200 feet in diameter is being dug to carry the water; at the end of the tunnel an underground hydro-electric power station will be built.

To continue our journey we cross the Semenov Pass to the north of Lake Sevan and enter the region of wooded mountains which contains the town and health resort of Dilizhan. Armenia has very little forest land (about nine per cent of its area), so that we find all the greater pleasure in the shady woods of the northeast and have still further evidence of the great variety of landscape in Armenia. There is a fine motor road from Dilizhan (incidentally, Armenia has many excellent roads), by which we can travel to Akstafa, that is return to Azerbaijan, or go on to Kirovakan, a town on the railway which connects Armenia with Georgia, the same railway that we took when we traveled south. We shall take this line again and continue through Georgia, the third of the Transcaucasian Republics, to the Black Sea. Now we shall be able to see by day that part of Armenia through which we traveled in the night; the picturesque gates of Armenia, the densely wooded Lory Ravine through which the railway runs from the Armenian Highlands. On the borders of Georgia we pass the Alaverdy copper mines and refineries. The buildings and copper workings again remind us of those changes that have taken place in the economy of Armenia, changes that have made a once backward agricultural country a flourishing industrial republic.

We have covered a circular route through Armenia and have seen many interesting things; we have missed a number of things; on the Iranian frontier, for example, there is the Armenian dry sub-tropic region where dried fruits are packed at Megri and where copper is mined at Kafan and Zangezur. On the mountain pastures of the southeastern regions there are tremendous herds of sheep that come from the Armenian valleys and from the neighboring Karabakh republic.

The most important things we have seen. We have seen Mount Ararat not only in its heraldic form on the republican coat of arms but also in the blue Armenian sky. We can recall the changing landscape of Armenia which for all its great variety has certain predominant features: the dry transparent air, the stony mountains, the glaring sun, and the wonderful greenery that has been developed by thousands of years of human toil. We may admire the fine Armenian people who, despite all the vicissitudes of history, have retained their ancient culture and have held on to their native land and we have seen how they have been given every opportunity for national regeneration as a member of the family of nations of the USSR.

We shall begin our tour of Georgia with its capital Tbilisi (Tiflis). The railway from Armenia takes us to the junction of Navtlug on the main Transcaucasian Railway which runs from the Caspian to the Black Sea, from Baku to Batumi. From Navtlug it is only five miles to the Georgian capital.

XV. THE HEART OF GEORGIA

TBILISI lies in a huge treeless bowl surrounded by the dry stony slopes of mountains. The Kura River, muddy and turbulent, rushes through the city in its deep channel. The jagged outlines of huge mountain ranges fills the whole horizon. The air is hot and clear but not so hot or so transparent as that of the Armenian plains.

Tbilisi (Tiflis) is at least 1,500 years old. Its geographical position to a very great extent determined its development as the historical center of the whole Transcaucasus; at this point the old trade route along the Kura Valley from the Caspian to the Black Sea is crossed by routes that use the passes over the Caucasus. Relics of the past still remain in the old Georgian spire-capped churches, the ruins of the fortress and the sections of the city which still have narrow winding streets. Old Tbilisi, however, is lost amongst the modern European sections with their

wide boulevards, and numerous tall buildings, the best of which have been built during Soviet times, notably the Government offices.

Prospect Rustaveli, the main street of Tbilisi where the best hotels, shops, museums, and the government offices are to be found, is always crowded with traffic and pedestrians. The embankments of the Kura have been built up and asphalted. Everywhere there are masses of greenery and a street that is not lined with trees is a great rarity.

The Tbilisi landscape is dominated by the steep sides of Mount David; a funicular railway carries people to the top, a favorite spot for holiday excursions. From the top of Mount David the whole city is visible; it is built on a number of tiny hills and from above looks like a huge collection of beehives. The people of Tbilisi love their city and are very fond of sitting on Mount David at night watching the twinkling lights below. There is a restaurant built right on the edge of a cliff where they sell the best Georgian wines. In the city itself there is a wineshop in almost every street for Georgia has cultivated the grape for many centuries and makes some of the best wines in the USSR.

Although the population of Tbilisi is less than that of Baku (in 1939 it was slightly more than half a million), it is the busiest and most beautiful of the three Transcaucasian capitals.

Tbilisi is in the center of the Transcaucasus and before the Revolution was the seat of the tsarist governor. There were more soldiers, police and civil servants in Tbilisi than there were workers. Its only industries were the railway workshops and the preparing of tobacco and leather as cottage industries. The Tbilisi workers, however, have old revolutionary traditions. It was here that Stalin began his revolutionary activities.

Soviet power has brought industry to Tbilisi. There are big engineering works which turn out machinery for the oil, tea, and wine industries of the Transcaucasus. There are also knitted goods, cloth and silk mills and a new boot and shoe works that turns out millions of pairs a year. A huge iron and steel mill is

now being built near Tbilisi, the first in the Transcaucasus; this mill will supply the whole region with iron and steel using the iron ore of Azerbaijan and the coking coal from Tkvibuli and Tkvarcheli in Georgia.

Like Erevan Tbilisi is not only a political and economic center, it is also the concentration point of cultural institutions. There are some splendid theaters in the city, especially the Rustaveli Theater of Drama and the Opera House. The Georgian Academy of Sciences has its headquarters at Tbilisi; there are also several research institutes and higher educational establishments. The Tbilisi museums have a fine collection of Georgian antiquities and the National Gallery in addition to the works of old masters contains the best pictures of modern Georgian artists, Toidze, Pirasminoshvili, Gudiashvili, and others.

The wealth of the modern Tbilisi museums and libraries, the brilliance of the Georgian theater, the great scope of modern Georgian prose and poetry all serve to show us the great cultural heritage which the Georgian built up in the course of their long and rich history. The Georgians are one of the oldest peoples of the USSR. According to tradition the ancient Greeks first began to smelt iron in the Transcaucasus. Georgian literature was flourishing in Georgia at a time when many European peoples still had no written language. The great Georgian humanist poet, Sh'ota Rust'hveli wrote his great poem, "The Knight in the Tiger Skin" in the 12th century, long before the Renaissance in Europe.

For a thousand years the Georgians fought for their independence against the Romans, Arabs, Iranians, and Turks. At the beginning of the nineteenth century Georgia placed herself under the protection of Russia which saved her from the Turkish yoke. Still the lot of the masses in Georgia was no happy one. The tsarist government entered into an alliance with the local princes and nobles and the masses of the people remained without any rights whatsoever. It was amongst the people, however, that the ancient Georgian cultural traditions were preserved, a

culture that is difficult to separate from the national character. The Soviet revolution not only brought Georgia on to the road of economic, but also of cultural progress, a fine example of which is modern Tbilisi. There is one fact alone that is evidence of the cultural progress that has been made: at the time of the 1939 census there was a larger percentage of people in Georgia with higher educational qualifications than in any other Soviet republic.

Amongst the peoples of the Transcaucasus the Georgians have always been outstanding for their happy way of life, their great talent and a special studied elegance in art and in manners and customs. The Georgians have developed a special etiquette in the course of centuries which the Georgian today still loves and tries to observe under all circumstances. At the dinner table there is a special ritual of toasts and songs doing honor to host and guests alike. The doors of the house are always open to all visitors. The same elegant customs are observed in the *dukhana*, the village inn or in the biggest Tbilisi restaurant which outwardly resembles those of Europe. The dinner is conducted by the *tamada*, the master of ceremonies, who rules supreme at the table and is responsible for the strict observance of etiquette; the *tamada* is like the *compère* of a concert and is always ready with apt quips, comparisons, and epithets, he is the conductor of the merry table. The merry lyrics of ancient Georgia remind us somewhat of the songs of the troubadours of Provence who were at one and the same time tender lovers and gallant knights; the Georgian "Knight in the Tiger's Skin" has much in common with the medieval chivalry of southern Europe. Gallantry to women arises from the position of equality and respect in which women in Christian Georgia have always been held—a great contrast to the Moslem east.

The Georgians love company and jollity; the directness of the Georgian's jokes is accompanied by a finesse in the same way as the bouquet of Georgian wine is a result of its maturity.

This happy southern temperament bubbling over with life

is combined with an ancient, wise, and noble culture which has taught this fortunate nation to love creative labor and happy leisure. The Georgians have remained true to these cultural traditions throughout all the trials and tribulations they have experienced; today Georgia is a large and flourishing state in which the national characteristics of the Georgians have full play. The traveler can never forget the Georgian temperament for it harmonizes so well with the country itself, with the colors of its mountains and valleys, its villages and towns.

XVI. STALIN'S BIRTHPLACE

Now that we have seen the capital of Georgia we shall set out on a trip through the interior of the republic. We must select a route. To the east is Kahetia, famous for its wines; the valley of the river Alazan with its vineyards and tobacco plantations is sheltered from the north by the steep slopes of the Caucasus. Kahetian wines—Napareuli, Tsinondali and Mukuzani—are amongst the best in the USSR. These wines are also exported. Kahetia enjoys plenty of warmth and sunlight and the snow does not lie long on the ground; in some years there is no snow at all.

GEORGIAN S.S.R.

Area: about 27,000 square miles.

Population: 3,500,000 (1939), predominantly Georgians but with many Ajarians, Abkhazians, Russians, Armenians, and Ossetians.

Neighbors: North—R.S.F.S.R., east—Azerbaijan S.S.R., south—Armenian S.S.R., and Turkey.

Relief: Mountainous (southern slopes of the Great Caucasian Range). Badly broken plain in the east; a wide valley spread into lowlands in the west.

Chief rivers: Kura with its tributaries Araghva and Rion; Ajaris-Tskhali.

Region of Russia since 1801 (greater part of the country).

Soviet Georgia established in 1921.

Autonomous Units: Ajarian A.S.S.R. (capital Batumi), Abkhazian A.S.S.R. (capital Sukhumi), South Ossetian Autonomous Region (capital Stalinir).

Produce: manganese, coal, oil, grapes, and wine, tobacco, fruits, tea, citrus fruits, and other subtropical farm produce.

Capital: Tbilisi (Tiflis)

To the north there is the famous Georgian Military Highway, a route frequently followed by Soviet tourists. There is always plenty of motor traffic on this road which winds through picturesque country. It was built at the beginning of the nineteenth century and was a bold engineering project for its time. It was designed to provide the shortest communication between the Cossack lines in the North Caucasus and the Transcaucasus (Georgia was included in the Russian Empire in 1801). The route ran through mountains inhabited by freedom-loving tribes that at that time had not yet been subdued by Russia. The road was therefore protected by army units stationed along it. This is where it gets its name from. There are other roads crossing the Caucasus from the north into Georgia that are of the same origin—the Ossetian Military and the Sukhumi Military roads.

If we follow the Georgian Military Highway it will take us past the picturesque town of Dushet and the automobile station of Passanauri to the steep slopes of the Great Caucasian Range. Our car takes up the zigzags of a winding serpentine road from which the departing traveler may cast a last look back at the green hills of happy Georgia. The road climbs up the Krestovy Pereval (Pass of the Cross), which rises to a height of 7,850 feet above sea level; at this height there is always snow in the immediate vicinity of the road, summer or winter. If we took this route we should cross the Georgian frontiers near Mount Kazbek (16,650 ft.), one of the highest peaks in the Great Caucasian Range, beside the roaring Terek River and through the gloomy Daryal Ravine to Vladikavkaz in the Ciscaucasus Region.

It is too soon for us to leave Georgia! Let us first go westward

across the whole of Georgia to the warmest part of this republic, the Black Sea littoral where tea and bamboo, tangerines and eucalyptus grow; let us go to Colchis, the Soviet Riviera.

The railway running westwards from Tbilisi is electrified for 150 miles. The first town on this railway is Mtskheta, at the confluence of the Kura and Aragvva. Mtskheta is older than Tbilisi and was the capital of Georgia in the sixth century. On a high cliff overlooking the town there is a pile of dark ruins, relics of the Middle Ages. Below the ruins stand the ferro-concrete buildings of the Zema-Avchal Hydro-Electric Power Station with its dam across the Kura. The power station is surmounted by a huge statue of Lenin.

The electric train continues further westward up the valley of the Kura.

The town of Gori stands amidst extensive orchards. The peak of the mountain which overshadows the town is surrounded by the walls of an ancient fortress. In 1879, in the family of a poor shoemaker of Gori Soso Joseph Dzugashvili was born, a man who was later to become known to the whole world as Joseph Stalin. A tiny brick cottage carefully preserved under a marble and glass pavilion contains everything exactly as it was in Stalin's childhood days. Tens of thousands of people visit this place every year to see the birthplace of their leader.

West of Gori the railway runs towards the Suram Mountains. The train finds difficulty in climbing the steep mountain slopes and we begin to realize why it was so important to electrify this section of the railway. The powerful electric locomotive can take a bigger train up the slopes than a single steam locomotive could.

The valley of the Kura grows narrower and turns left, to the southwest. Here in a deep wooded ravine are the mineral water springs of Borzhomi. High above the health resort that has been built at the springs, there is the Bakuriana Mountain Zonal Station, 5485 feet above sea level at the point where the conifer forests cease and the alpine meadows begin; this station is a skiing center in winter.

The train climbs up the Suram pass but does not reach the top; through a three mile long tunnel we come out on to the western slopes of the mountains and immediately find ourselves in another world, a region of wet subtropics. This is the basin of the River Rion which is open to the hot wet winds from the Black Sea. The slopes of the mountains and the lowlands are covered with dense woods.

The train carries us past the Chiaturi Manganese Mines, some of the biggest in the world. The extraction of the ore here is mechanized. A stream of the beautiful violet-colored earth is being constantly loaded from the mine tubs onto railway wagons. At the station of Zestafoni there is a plant which produces ferro-manganese from the ore; this product is needed for the manufacture of steel.

At the point where the Rion enters the plains stands the town of Kutaisi. This is a region of greenery which scarcely ever knows a winter. Silk and cloth mills and fruit canning plants have been built here during the past few decades and Georgia's first automobile works is being built there today. A hydro-electric power station has been built near the Rion which supplies water to the turbines through a tunnel. Coal is extracted at the nearby Tkvibuli colliery.

After passing Kutaisi, the valley of the Rion spreads out into the Rion lowlands. Here it is hot and damp with the atmosphere of a forcing house. The air is humid, the ground is wet and there are many swamps. The dense tangle of underbrush and tall grasses form real jungles. In every village we see the white buildings of the malaria stations. The houses of the peasants are built on high stone columns to protect them from the damp. This is Colchis, the land of legend to which the Greek Argonauts came in search of the Golden Fleece. The Greeks believed that a sheep lived here whose fleece consisted of strands of gold instead of little curls of wool. Today geologists have discovered that the Ingur River which flows through Colchis carries with it tiny particles of gold; the Colchians in ancient days recovered

gold from the river by the very primitive method of sinking a sheepskin into the water. The heavy particles of gold always sank to the bottom of the river while other lighter mineral substances were carried away at the surface. The sheepskins remained on the bottom of the river until there was a sufficiently big collection of the valuable metal in the thick wool. Thus the dream of a fleece of pure gold was born, a dream which in turn gave birth to a legend which today still charms us by the wonder of its author's inventiveness.

The placer gold of the Ingur is today considered insufficient to warrant the establishment of gold workings and the source of the gold has not yet been found. It is supposed that there is a deposit of gold in the mountains somewhere under the glaciers and the eternal snow which some fortunate mountain climber will one day find. The inhabitants of Soviet Colchis have no need for a Golden Fleece, their gold is in the wonderful land that has been made so fertile by the climate and the toil of generations of farmers. Now let us examine this section of the Black Sea littoral more closely.

XVII. THE GOLDEN FLEECE OF COLCHIS

THROUGH the gaps in the trees we can already see the waters of the Black Sea. The train takes us right down to the seashore. From below the mountain slopes look as though they are corrugated; these corrugations are the terraces of the plantations where people are at work in huge sombrero-type straw hats.

The Rion of Colchis Lowlands are intersected by the Rion, Ingur, Supsa and several other rivers flowing from east to west. They all rise in the mountains and bring down large quantities of silt. This silt raises the beds of the rivers which overflow their banks. The sandbar raised by the tides prevents the flood water from reaching the sea. In this way the Colchis swamps were formed.

Colchis and the adjacent mountain slopes have a moist sub-

tropical climate. The downpours of rain are terrific, the water seems to fall in one solid sheet. The annual rainfall of Batumi, over 100" a year, is the highest in the USSR and is as high as that of Singapore. If the water did not evaporate or flow away to sea a single-storey bungalow would be sunk up to the eaves in a single year.

The Black Sea littoral of Georgia is sheltered by mountains from the north winds. The summers here are hot and the winters very mild which permits farmers to raise subtropical crops or Mediterranean crops. Despite the great fertility of this region it was almost uncultivated before the revolution. The poverty-stricken peasants, constantly ill from malaria, planted maize on land where a full-grown orange tree will bear 7,500 fruits a year. The state and collective farms organized in Soviet times cultivate large fields of tea, tangerines, oranges, lemons, tung trees, loofahs, ramie, plants yielding the essential oils needed for the perfumery trade, laurels, olives, and many other valuable crops.

Gigantic drainage works are now under way in Colchis to make the region more healthy and culturable. Canals have been dug, earthen banks erected (parts of the Rion are confined between dykes nearly twenty feet high) and the level of the land has been raised by artificial regulation of the deposit of silt. Thousands of acres have already been drained. The eucalyptus tree is being widely planted; this tree takes very large quantities of moisture from the soil while its distinctive odor drives away the malaria mosquitoes. The rotting jungles are rapidly disappearing and are being replaced by flourishing plantations and health resorts.

The introduction of collective farms and the production of subtropical crops for the market has completely changed the living standards of the Colchis peasants. The harvest yield of tea in some of the collective farms is above the average for India, Ceylon, and Java. Although the cultivation of subtropical crops is a comparatively modern innovation, the produce obtained covers a considerable part of the Soviet Union's needs of those

products which on account of climatic conditions cannot be grown elsewhere. In 1943 Western Georgia produced over 60,000 tons of tea and about 500 million tangerines.

The railway line ends in hot and humid Batumi. This is the southernmost town on the Georgian seaboard.

Batumi has an important place in the history of the revolutionary movement in Russia. It was here that Stalin spent the years of his youth, here he worked in an underground printing press, here he became known as a working class leader before he earned fame in Baku, another Transcaucasian industrial town.

Batumi is an important manufacturing town employing the chief raw material of the Transcaucasus—oil from Azerbaijan, which comes in railway tankers and by pipeline. The skyline is that of huge oil refineries with the gray oil reservoirs and petrol tanks that we first saw in Baku. The preservation of the citrus fruits gathered on the Georgian plantations is now also organized in Batumi on a large scale.

Batumi is the capital of the Ajarian Autonomous Republic; Ajaria is inhabited by the Ajarians (related to the Georgians), by Russians and Georgians. Some specific features in the culture and language of the Ajarians determined the necessity, in accordance with the Soviet national policy, of separating Ajaria as an autonomous republic within the Georgian Soviet Republic. The best tea plantations in the Soviet Union are at Chakva, not far from Batumi. Widely known throughout the Soviet Union is the Botanical Garden at Green Cape, a few miles from Batumi, where there are sections growing Indian, Japanese, and Mediterranean flora. It is visited by thousands of tourists annually who are attracted by the possibility of wandering through bamboo groves, gazing on palms of all varieties and enjoying the view of luxuriant tropical flowers without having to leave their own country. For the inhabitants of most of the Soviet Union the tropical plants that grow in such abundance in the open at Green Cape are something wonderfully exotic that they know only from drawings, herbaria, and the lessons of school teachers.

Several large sanatoria and rest homes have been built at Green Cape and many Batumi people have summer cottages there. Tobacco is cultivated and there is extensive cattle-breeding in the mountains of Ajaria.

One may travel northwards along the Black Sea coast either by the motor road which follows the coastline or by the railway which traverses the whole of Abkhazia. This splendid railway was completed during the war and provides the Transcaucasus with a reserve railway to the central parts of the country.

The Abkhazian Autonomous Republic, also a unit of the Georgian Soviet Republic, lies to the north of Ajaria between the southern wooded slopes of the Caucasus and the Black Sea. The population consists of Abkhazians, Georgians, Russians, Greeks, Armenians, and other nationalities.

There are subtropical plantations right down to the seashore. Higher up the slopes there are tobacco plantations which produce the best tobacco in the USSR. Higher up there are the Abkhazian forests of beech, oak, chestnut, and box. The most interesting is the boxwood, it is as hard as iron and components for a number of machines are made from it.

In addition to agriculture industry is beginning to develop in Abkhazia. Coal is mined at Tkvarcheli where a big power station has been built.

There are many sanatoria in Abkhazia; the town of Gagri is the warmest place in the Transcaucasus. It is protected from all cold winds by a picturesque wall of mountains that come down almost to the sea. On the narrow strip of land between the mountains and the sea there is a luxurious park in which there are a number of sanatoria between the avenues of thick-stemmed palms.

Sukhumi, the capital of Abkhazia is also a splendid health resort. The town lies on the mountain slopes around a big bay. Palms, magnolias, camelias, yuccas, oleanders, and agavas grow in the gardens and on the boulevards. It is so warm in this town that hundreds of monkeys of all breeds that are kept here in a

nursery for medicinal purposes live in the open, almost all the year round. For a very short time in winter the more delicate of them are compelled to take to the houses that have been built for them. This short period, however, is only "winter" for monkeys, the plants at any rate do not recognize it as such. Many of them grow in the open the whole year round.

There are places on the seashore where one can see the snowcaps of the mountains through the broad leaves of the palm trees.

Such is Georgia, land of warmth and sunshine, rich in vegetation and glorious mountains, a land with a beautiful climate and happy, carefree people.

XVIII. THE WARM BLACK SEA

Our trip across the Transcaucasus has brought us to the Black Sea. Its coastline, both the Caucasian and the Crimean, is a long chain of health resorts with sanatoria, hospitals, and rest homes. This is the best holiday district in the USSR, where millions of people from the northern regions spend their summers. In the past only the richest people could go to the Black Sea. In the Soviet Union today it is a rare thing to find a factory or office worker who has not been to the south at the expense of the state or the trade unions at least once in his life. Before the Second World War there were sanatoria for peasants in the Crimea.

At Batumi, Sukhumi, Gagra, or farther north at the most highly developed of all the Black Sea health resorts, Sochi, we may board a steamer and continue our journey by sea. The steamers which ply the Black Sea from Batumi to Odessa are maintained mostly for holiday makers and are appointed with all comforts in accordance with this specific traffic.

The Caucasus Mountains shelter Batumi, Sukhumi, Gagra and Sochi from the north winds; the Crimean Mountains do the same for Yalta, Simeiz, Alupka, Alushta, Gurzuf, and other

health resorts on the southern coast of the Crimean Peninsula. Although these health resorts are more northerly than those of the Caucasus their vegetation is also Mediterranean with some subtropical features. The crops grown, grapes, tobacco, and fruits, give Crimean agriculture specific southern features, although the Crimean winters are too cold for tea and citrus fruits.

The Crimean seacoast is more rocky than the Caucasian. The Crimea beaches are separated by steep, high cliffs which sometimes project into the sea for long distances; they are smaller and more picturesque than the somewhat monotonous beaches of the Caucasus which stretch for many miles unbroken by any rock.

Throughout the long southern summer the Black Sea both in the Crimea and the Caucasus gladdens the eyes with its deep amethyst blue. The shore rises steeply from the sea and in the many amphitheatres of the valleys there are white sanatoria, former villas, and palaces, amongst dense growths of cyprus, oleanders, grapes, and tobacco; the rich marble facings of the best of these remind us that they once belonged to the Russian emperor and his family. Today they are sanatoria and rest homes for workers, professors, writers, peasants, and schoolchildren. At Livadia, near Yalta there is the former residence of the Tsar which we all know from photos and films of the United Nations conference that was held there. Here and there we find the ruins of Genoese forts. The whole landscape is dominated by the rocky peak of Ai Petri, one of the highest points on the steep ridge of the Crimean mountains (4,070 feet).

On the Black Sea there are a number of important commercial ports. Batumi is the Soviet Union's chief port for oil export. Oil is also loaded at Tuapse where oil is brought by pipeline from Grozny in the same way as it is brought to Batumi from Baku. At Odessa, Nikolayev, Kherson, and Novorossiisk hundreds of steamers fill their holds with golden grain or tightly packed sacks of flour from the Ukraine and the Kuban. Novorossiisk is also famous for its cement, considered the best in Europe.

In the last century this cement was exported, for example, for the building of the fortress of Gibraltar.

There are important fisheries on the Black Sea and the whole country knows Kerch herrings, Odessa mullet, mackerel, and goby. There are big canneries at several of the coastal towns.

The Black Sea is very deep, in places it reaches a depth of 6,600 feet, where the Crimean Mountains could be completely sunk. Fortunately the fish live in the upper 600 feet of the water; the lower depths are extremely salty and contain hydrogen sulphide. In the Bosphorus and the Dardanelles which join the Black Sea to the Mediterranean there is a double current: the water flows from the Black Sea by a surface current while the saltier and denser water of the Mediterranean returns by a current on the seabed.

The Black Sea does not freeze, which makes its ports especially valuable to the USSR; in the coldest winters there is sometimes a thin sheet of ice at the northernmost part of the sea but it is not thick enough to interfere with shipping. In the winter, however, there are heavy storms which the tourists and health resort visitors of the summer know only by repute.

The Sea of Azov is really a bay of the Black Sea which goes deep inland between the Crimea and the Caucasus. It is a shallow stretch of water and modern vessels can only reach Rostov, Taganrog, and Mariupol by means of canals dug in the seabed. These ports also export large quantities of grain while Mariupol also exports coal from the Donetz Basin. The Russians held the northern shores of the Black Sea in ancient times and at the time of the Kiev state (tenth to twelfth centuries) it was called the Russian Sea. The princes and merchants of Kiev crossed this sea to Byzantium. The Mongolian invasion drove the Russians from the Black Sea which became the home of the nomad Nogai Tartars. Later the Crimean Khans, with the support of Turkey, cut the Russians off from the sea; only the free Cossack republics set up on the Don and the lower reaches of the Dnieper disputed the right to the Black Sea with the Turks. The men of

Zaporozhye boldly shot past the Turkish forts in their frail boats and made deep raids into Anatolia. The Don Cossacks fought a long and bitter struggle for the mouth of the Don and the Sea of Azov. In the eighteenth century Russia regained the northern coastline of the Black Sea. The Caucasus coastline to which the Turks held on stubbornly, became Russian only in the nineteenth century. By this time Russia was firmly established on her natural southern sea frontiers with their center at Sevastopol, the main base of the Black Sea Fleet. The Fortress of Sevastopol has twice played an important role in the defence of the southern borders of the country—in 1854–55 and in 1941–42 it was besieged—and although it was captured on both occasions after a gallant defence, of which the Russians are justly proud, its capture cost the invaders dear. In 1854 the fight for Sevastopol employed all the Anglo-French forces and the Crimean War (which the Russians called the Sevastopol Campaign) was localized in the eleven-months battle for the fortress.

The Defence of Sevastopol in 1942 slowed down the German advance into the country and helped towards the defeat of the Germans at Stalingrad.

The southern borders of the Ukrainian and Moldavian Republics which we shall visit on our next journey lie on the Black Sea. Now let us return to Moscow to start our next trip of exploration.

3. ACROSS THE SOUTH- WESTERN STEPPES

I. THE ROADS OF WAR

A TRIP TO THE SOUTH and southwestern regions of the USSR is a journey following the trail of the war across the Ukrainian and Moldavian Soviet Republics. The war is over and the German armies that penetrated deepest into the USSR in this southern region no longer exist, but the traces of the invasion are everywhere visible, the wounds are still not healed. Germany owes a tremendous debt to the people of the USSR, but the greatest of all is the debt they owe the Ukraine, Moldavia, and western regions of the R.S.F.S.R. The picture of the devastation is a sadly monotonous one: along the railway lines there are temporary, hastily erected buildings, often of charred logs—just enough to get the stations working; in the towns there are the skeletons of burnt or blown-up houses and factories. The rehabilitation of these factories is no easy task, for the time being they are only half built and are working at part capacity while the repairs are being completed. The mines are filled with water which has to be pumped out; the bridges have been replaced by temporary wooden structures which the sappers built; the trains cross the rivers slowly and cautiously. Life is gradually being reorganized. It is difficult to supply the towns with sufficient water through the hastily repaired water mains; there is not enough electric power for the people and for industry. The countryside lost the greater part of its cattle

and farm machines; very many farmers' houses and farm buildings were burnt down or destroyed.

Against the background of this colossal destruction there are the terrific human losses—they are difficult to calculate and when calculated almost impossible to imagine. Very incomplete preliminary estimates for the Ukraine alone give the following astronomical figures: killed 2,500,000, missing 1,500,000, driven off to slavery in Germany 3,000,000. This means that the civil population of the Ukraine was reduced by at least ten to fifteen per cent. The victims of the unprecedented slaughter of the Jews number many hundreds of thousands.

These are only the direct losses. Added to this is the extremely low birth rate during the occupation period and its abnormally high death rate. The rehabilitation of the devastated areas is being carried on in obviously underpopulated regions with a consequent shortage of workers; this means very intensive work although the help from the regions which did not suffer the horrors of occupation makes the task easier.

In our journey we do not only want to see the miserable picture of destruction and the heroic efforts of the weakened population. We do not want our journey to show only what was there when we were traveling, in 1945. We want to get a glimpse through the dispelling smoke of recent conflagrations and see what the region was before the war and what it will soon be again. We shall not make our journey a tiring list of destruction, although here and there we shall make pilgrimage to the worst of them so that we may feel more acutely the necessity of organizing the post-war world in such a way that the mad fascist beast, which the democratic peoples have destroyed, may never rise again.

II. THE RUSSIAN WOODED STEPPELANDS

ONCE again we shall begin our southward journey from Moscow. In the very center of the city, opposite the magnificent building

of the Bolshoy Theater, we enter the Moscow Underground Railway. A short run over single stretch of line takes us to the Kursk Railway Station. On the big open square in front of the station there are trams, buses, and trolley buses. When the first lines of the Underground Railway were built it was designed to link up as many of the railway termini as possible so as to enable the thousands of suburban passengers to transfer to the Underground and reach the center of the city without any waste of time. The underground line is the equivalent of bringing the railway termini right into the center of the city.

The train that we take to the south leaves from Kursk Railway Station and passes through a belt of suburban settlements and summer cottages that is already familiar to us. For some distance from Moscow the Kursk Railway is electrified and all the suburban trains are electric.

We pass through the industrial townships of Podolsk and Serpukhov, through big, noisy Tula which looks like a whole palisade of factory chimneys. This was the limit of the Germans' advance. In the autumn of 1941 they almost completely encircled Tula. The town held out thanks to the heroic defence put up by the workers' battalions. The old Russian armory did not fall into enemy's hands.

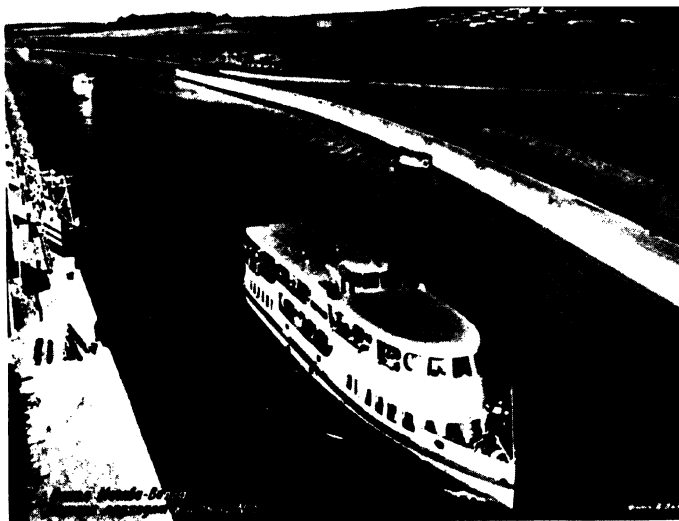
Not far from Tula is the home of Leo Tolstoy, Yasnaya Polyana, the place where he lived and worked. During the occupation the Germans deliberately desecrated this monument to Russian and world culture. They smashed Tolstoy's furniture and other things while they burnt others, they cut down the trees which Tolstoy planted and stole irreplaceable documents and pictures. Everything that could possibly be done to restore the place was done immediately after the Germans were driven out.

We have already passed the industrial center. In place of factories and factory housing estates we now see the villages of the agricultural zone. There are no longer the frequent large forests and the grayish-yellow and light brown *podzol* soils; their place is taken by the dark *chernozem*, which is intensively



ALONG THE VOLGA

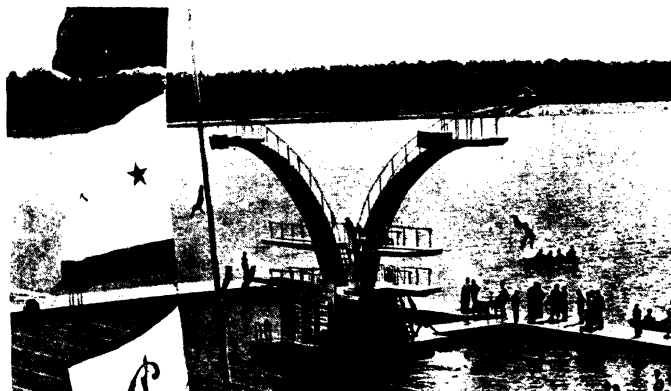
The Kremlin at Kazan, typical example of Tatar architecture.



ALONG THE VOLGA

ABOVE: On the Moscow-Volga Canal.

BELOW: Aquatic station on the Khimki reservoir.



farmed, and the villages are more frequent. This is the historical region which the Russians won back from the Tatars step by step between the fifteenth and seventeenth centuries. The Tatars drove the Russian farmers northwards into the woods around Moscow and completely depopulated this region. The Tatars themselves kept their herds in the steppes south of Muscovy. The Russian Chroniclers called these steppes the "Wild Field." The woods of this purely agricultural region have now completely disappeared but in ancient times they ran down the valleys in a fantastic pattern; the water divides consisted of open steppes which sent their spurs far out to the north. The long black ribbons of the Tatar roads, the *saqma*, that had been trodden bare of grass by the hoofs of thousands of horses, ran along these water divides. These were the routes used by the Tatars in their raids on Russia.

As Moscow gained courage, grew stronger and gathered around her the Russian lands, she threw off the Tatar yoke step by step. An offensive against the steppes which continued for three centuries had begun. The conquest of the inhabited black-earth steppes to the south of Muscovy was the first act in this war.

The "Wild Field" was settled firstly by the troops and officials that the Moscow government sent there to form a line of defence against the raiding horsemen of the steppes and secondly by runaway peasants who fled to the steppes to evade the serfdom that was introduced at that time. The forest was the ally of the Russians; the villages that sprang up like mushrooms were hidden in the forests, the contours of the forest massifs to a considerable extent determined the position of the palisaded fortress-towns which were built with due consideration paid to the local topography so as to bottle up the defiles between the forests formed by the water divides and to connect the towns with each other by means of continuous lines of defences—ditches, ramparts (traces of which still remain) and especially abatis. The abatis was an important means of defence against

the Tatar horsemen. They consisted of felled trees, the ends of their trunks and branches pointed and turned in the direction of a possible attack. These when piled one on top of the others were even difficult for men on foot to surmount. The abatis could, of course, only be built in the forested sections of the country so that here again the forest became the ally of the Russians.

These fortified lines were a tactical weapon of defence, but they also served strategically for purposes of offence, for the gradual conquest and occupation of the "Wild Field." The "Tula Line" was replaced by the "Belgorod Line" which continued as far as the Volga in the east (the Simbirsk Line) and then continued beyond the Volga. From the middle of the sixteenth to the middle of the seventeenth century the Russian system of defences was gradually advanced to the south until the frontiers of the "real" steppes were reached.

A dense farming population soon occupied the lands that were protected by the lines. Places that had been empty and depopulated soon became overcrowded. The state made the peasants the serfs of the soldiers and officials who became landowners. The system of serfdom and the rule of the landlords in the eighteenth and nineteenth centuries reduced the very numerous peasantry of the central black earth region to a state of dire poverty. There was very little improvement after the abolition of serfdom in 1861, because much of the land that had been farmed by the peasants remained in the possession of the landlords. The smallness of their farms compelled the peasants to intensify their farming, increase their plowlands at the expense of the forests, pastures, and meadows; there was less fodder and a consequent reduction in the herds of cattle; the land was plowed out and there was not even enough manure to return it to its former fertility. Their poverty prevented the peasants from improving their farming methods.

The type of the peasant farm changed when the Soviet authorities distributed the landowners' lands amongst the peas-

antry—farming became considerably more profitable. The checker-board pattern of tiny plots of land has disappeared, the importance of animal husbandry has increased although the plowlands still predominate over other forms of farm property; this hypertrophy of the plowlands makes the black earth belt so different from any other region of the USSR, where the differences in the types of agricultural property make the landscape more pleasing to the eye. The fields of fat black earth are badly cut up by a network of gullies, the result of the wastefully felling of forests in the past which laid bare the soil to be washed away by the spring floods. In the past this region of Russia gained the unenviable reputation of a district in which ravines formed at catastrophic swiftness as a result of the irrational farming. Every spring the floods carried away hundreds of square miles of fine black soil and the gullies that were eating up the fields grew visibly. Russian geographers and soil scientists, especially Dokuchayev, were able to trace all the processes of soil erosion and the formation of ravines in this region; their studies in this field won world-wide recognition. Today a new ravine is a rarity; the sides of the old ones have been artificially turfed to hold them together and the brinks have been strengthened. It is strictly forbidden to plow up and down the slopes as each furrow may become the embryo of a new ravine. The big collective farm with the help of the state can do what the poor peasant or even the big land-owner could not do. The frequent villages which we pass in our train tell us of the historic concentration of Russia's farming population in this region; they tell us of their former poverty, this was the classic land of the once typical bast sandals and wooden plows; the very cabins themselves, especially the old ones, differ greatly from those of the Moscow district; many of them have thatched roofs.

On this part of our journey we do not pass many towns—Kursk and Orel are the only two big ones before we reach the frontiers of the Ukraine. These towns have gone down in history as the scene of the great battle of the Kursk-Orel Salient

where the last big German attempt at an offensive was defeated in 1943.

Although many industrial enterprises have grown up in the black earth zone during recent years (mostly using agricultural raw materials—sugar refineries, starch and molasses plants, creameries and farm machinery works) and although the zone as a whole now has an industrial output that about equals its output of farm produce, rural predominates over urban scenery. We notice this particularly because we have just come from the Moscow region where the towns and factories are very close together.

Our train takes us almost due south and although the landscape of the black earth belt is monotonous there are changes in detail which combine to give us the feeling that we are already in other latitudes. The sun has become stronger over the fields of the slightly undulating land. By noon the heat makes itself felt. The fields of beet are larger and more frequent and, beginning with Orel, the villages are surrounded by orchards. Here they grow the big, hard sour-sweet Antonov apples that are known all over the Soviet Union. The soft climate of this zone is eminently suited to fruit-growing. At the town of Michurinsk (formerly Kozlov) there is a fruit selection and research center of world importance where hybrid fruit trees are developed to give bigger harvests and withstand the rigors of the climate. With generous help from the state this center grew up out of the amateur nursery of the botanist Michurin whose name was given to his native town, while he was still alive (1932).

The Michurin Institute has continued and developed his experiments on a large scale producing varieties of fruit trees and working out horticultural methods for regions such as the Urals, Siberia, and Leningrad Region which were formerly regarded as impractical for fruit growing; the Institute has provided saplings for planting in all these regions and has improved the varieties of fruits grown in the Moscow Regions, in Byelorussia and, naturally, in the black earth zone itself.

* * *

We are still traveling southward although at some places to the east of Kursk we cannot check up on this by means of the compass; this is the region known as the Kursk Magnetic Anomaly. The compass needle dances in the most fantastic fashion. The anomaly is due to huge deposits of iron ore and iron quartzite with high magnetic properties—apparently this is one of the largest deposits of its kind in the world.

The Kursk magnetic anomaly has been known for a long time although the survey of it was very incomplete before the Revolution. Soviet geologists have made a detailed study of the anomaly. The deep-lying iron-ore deposit has been fully surveyed. In the middle of an agricultural district the massive contours of the iron mines are now becoming prominent.

Beyond Kursk the plains are broken by the chalk hills that are characteristic of Belgorod (White City), which owes its name to the numerous chalk quarries which surround it.

III. ON TO THE UKRAINE

SHORTLY after we pass Belgorod we cross the frontiers of the Ukrainian Soviet Socialist Republic. The boundary line is an ethnical one and follows the line of demarcation between areas in which Russians and Ukrainians predominate. We soon notice the difference in the language. Ukrainian is very like Russian and the two languages are derived from common stock; everyday Ukrainian is understood by a Russian. The language, however, has a different melody. It contains musical vowels and soft consonants; the typical soft "G," almost an "H" is scarcely ever met with in any of the Great Russian dialects.

The atmosphere becomes warmer and the forests scantier. Log cabins give way to white-washed mud cottages, the *khata* of the Ukrainians. There are many orchards, but apples no longer predominate, their place is taken by cherries, black and white.

Gradually we come into the soft, pleasant landscape of the Ukraine that so many poets and writers have sung the praises

of. Naturally the modern landscape does not in any way resemble that which Shevchenko, Gogol, and Pushkin praised. The endless grass carpet of the steppes has long since been plowed up and fields of the state and collective farms stretch on without end. Very few of the picturesque farmsteads hidden in cherry orchards have remained; the collective farmers have moved into the big villages where living conditions are better, where schools have been built and where there are village power stations and medical clinics. The two-wheeled carts drawn by a span of oxen are no longer typical of the traffic on the Ukrainian roads: today there are more motor trucks than oxen . . . The natural background of the Ukrainian landscape is still there, however. This is a picture created by the soft, warm sun, the long flat hills of the steppes, the empty blue sky and the hospitality of the little white cottages.

Our train pulls into Kharkov, the first big Ukrainian city that we shall visit and its "second metropolis."

Kharkov can be seen from a long way off. Its big blocks of apartment houses built around the big factories are making a determined offensive against the steppes; in the Soviet period Kharkov has become the chief Ukrainian engineering center. Before the war Kharkov manufactured huge turbine generators each of which was equal to a whole electric power station, intricate electrical apparatus, tractors, locomotives, bicycles. . . .

The industries attracted large numbers of workers to the city (in 1939 the population was 833,400, fourth in size in the USSR). Sumskaya Street, the old main street became too small to hold the crowds of people, the new shops and offices and the new traffic. Kharkov began to spread and also to grow vertically.

Old Kharkov was a city of merchants, landlords, and government officials; it was completely reconstructed and was proud of its parks, monuments (especially the Shevchenko Monument), and the new city square on which were built Government House and Project House, buildings which combined the might of skyscrapers with an elegant style of architecture. This

ensemble, including the Shevchenko Monument, was typical of new Kharkov. The ultra-modern urbanism of the buildings was softened by the gigantic dimensions of the square on which they stood; the square and its gardens were so extensive that they were not dwarfed by the huge buildings.

The Germans turned these fine buildings of concrete and glass into smoke blackened skeletons. The rebuilding of the city is costing terrific labor but it is progressing. The Kharkov factories are working, tractors for example, are already being produced.

IV. THE COUNTRY'S COAL SCUTTLE

THE Ukrainian S.S.R. has developed into an important industrial state. The riches of its earth, its agricultural resources, the art and industry of its people place it amongst the leading regions of the USSR. Before the war the Ukraine produced about half the coal, three-fifths of the iron, three-quarters of the sugar and over a sixth of all the machines produced in the Soviet Union. We have already seen Kharkov, one of the most important Ukrainian industrial centers. In the Soviet period, especially in the years immediately preceding the war, industry developed very extensively in Kiev, Poltava, Vinnitsa, Odessa, Lvov, and many other Ukrainian towns. The industrial heart of the republic is the Donetsk Coal Basin (known as Donbas), which lies to the southeast of Kharkov. This is the leading coal, iron, and steel center of the Soviet Union.

After the train leaves Kharkov it runs into the Donbas, and we see on both sides a typical industrial landscape. Everywhere there are the pithead workings of the extensive collieries, the huge cone-shaped slag heaps that resemble Egyptian pyramids from a distance. Not far away we see the towering blast furnaces, the long blocks of factory buildings with their palisades of tall chimneys. Near each of the factories is a housing estate, sometimes a whole township. Some of the factories are so big

that they cover as much territory as a fair-sized town. Factories and towns are densest where there is the most coal. Branch lines run in all directions from the railway to the factories; on all sides there are the pylons of the power transmission lines. Big power stations supply current to each of the factories. The industrial landscape is similar to that of the Black Country around Birmingham or in Lorraine.

Some of the factories were built before the Revolution by foreign capitalists who were attracted by the riches of the Donbas: under Soviet power they have been completely reconstructed and extended and other, new, factories have been added.

The iron and steel mills of the Donbas are an interesting sight at night. When the molten metal is drawn off from the blast furnaces the whole countryside is lit up with a dull red glow against which are silhouetted the blast furnaces and their weird-looking scaffolding and the huge masses of the coke ovens. Great beams of light flash out across the steppes as the molten steel from the open hearth furnaces is run into the molds or when the huge ladles are transported from one shop to another.

The chimneys of the Donbas are smoking again today. Much of the destruction which the Germans wrought in the Donbas has been repaired. The region is once more showing the highest figures in the country for coal production but a lot more still remains to be done.

Every Russian knows the Donbas as the "country's coal-scuttle." Before the Second World War the Donbas produced half the Soviet Union's coal and three times as much as before the Revolution.

The industrialization of the country greatly increased the demand for coal. There were times when the development of the national economy was limited by the amount of coal available. This gave the miners of the Donbas a sense of their responsibility in building up the country and maintaining a high level of coal output. It was in the Donbas that the Stakhanov move-

ment began, a mass effort on the part of the workers to follow the example of Alexei Stakhanov who in 1935 reorganized the whole system of work in his pit and achieved a record output of coal. The Stakhanov movement became an important factor in raising labor productivity on the one hand and increasing the earnings of the workers on the other.

UKRAINIAN S.S.R.

Territory: over 211,000 sq. miles (biggest state in Europe except European part of USSR).

Population: about 40,000,000 (1939 population plus added population of Western Ukraine and Ismail Region, war losses not counted). Majority Ukrainians, second place held by Russians.

Neighbors: North—Byelorussia and R.S.F.S.R., east—R.S.F.S.R., south—R.S.F.S.R. (Crimea), Moldavia and Rumania, west—Czechoslovakia, Poland, and Hungary.

Relief: Mainly plains. Some uplands: Volynsk-Podolsk Plateau and Donetsk Ridge. In west: Carpathians where some peaks (Goverla, Pope John) reach 6,500 feet.

Chief Rivers: Dnieper 1,430 miles with tributaries Desna and Psel; Southern Bug, Northern Donetsk (tributary of the Don); Dniester.

Produce: coal, iron, and manganese ore, salt, oil, phosphorites, potash, wheat, sugar beet, tobacco, cotton (a recent addition), cattle, and pigs.

District of Russia since 1654 (main part). Up to 13th century center of union of feudal principalities known as Kiev Rus and including the still undifferentiated Great Russian, Byelorussian, and Ukrainian branches.

A Soviet Republic since 1917: first Soviet constitution adopted 1919 after German intervention. In Western Regions Soviet power introduced 1939.

Capital: Kiev.

In the USSR the title "Stakhanov worker," is the synonym for a clever worker who gives his country considerable strength and ingenuity and who as a consequence lives well and is respected

by all. The Donbas is a coal-mining region that has been highly developed technically and bears little resemblance to the coal field of capitalist days when labor was cheap and the workers were not so highly skilled.

The coal is cut with machines and pneumatic hammers. Electric trains take the coal from the coal face to the pitshaft. At Lisichansk in the Donbas, the first experiments at underground gasification were made shortly before the war. The coal seams are set on fire under the ground and the gas released comes to the surface in pipes and is distributed for use. The heavy work of the miner is eliminated when the gas is produced under the ground, the productivity of the workers employed is raised from five to ten times. The idea of underground gasification was first put forward by the Russian chemist Mendeleyev in the nineteenth century.

The Donbas mines are being rebuilt at top speed. The Donbas is already turning out large quantities of coal. The big industrial cities of the Donbas are coming back to life—Stalino, Makeyevka, Gorlovka, Konstantinovka, Kramatorsk, Voroshilovgrad, Artemovsk. The power stations of the Donetz Basin are also being rehabilitated including the big stations at Shterovka and Zuyevka which burn coal dust as fuel.

Apart from coal other Donbas products are iron smelted from the ores of Krivoy Rog, machines, zinc, fertilizers, soda, glass, mercury, and salt. The Donbas engages in the full cycle of industrial production, from raw materials to the most intricate machines. It is quite common to find wheat sown on the land above the coal mines.

V. THE UKRAINIAN STEPPE

ALREADY we have left the Donbas behind us. There are no more towns, no heaps of coal and slag on the ground, no smoke in the sky. Steppes. . . .

The climate is mild and warm, eminently suitable for farm-

ing. In the southeast there are sometimes droughts. The black earth regions of the Ukraine are extremely fertile; in the south the earth is no longer black but chestnut color, but it is still just as fertile.

The Ukrainian S.S.R. is a land of big farms working with modern machinery. The great plains of the steppes seem to have been designed by nature to show the advantages of large-scale collective farming. There is nothing to hinder the mighty tractor that drags its plowshares almost to the horizon; the even line of the furrows stretches for miles unbroken. When the harvest is being gathered in, the combines and other reaping machines travel unhindered for miles. During the period of field work the bigger collective farms, in order not to waste time in traveling from the villages to the fields, set up temporary living quarters—field camps—where everything required by the farmers is brought on trucks.

The Ukraine occupied one of the first places in the USSR, in reorganizing agriculture and technically re-equipping the farms. The first Machine and Tractor Stations were set up in the Ukraine. By providing the collective farms with modern machines their success was assured.

The German invasion was the cause of great damage to the collective farm villages of the Ukraine. The Machine and Tractor Stations, the mainstay of the collective farms, were all burnt down. Many villages were burnt to the ground: the Germans destroyed over half a million farmers' houses and about the same number of farm buildings. The losses in human lives in the Ukrainian villages were also very high.

Nevertheless the Ukrainian farms are being very rapidly rehabilitated, more rapidly than the towns and the industrial centers. The Ukrainian villages have already acquired much of their normal appearance. The collective farm system has also shown its great vitality in the Ukrainian villages. Like a bent spring that has been released and jumps back to normal, so the Ukrainian villages, after the expulsion of the Germans, returned

to what had already become the natural collective method of tilling the soil. The savage anti-socialist agitation of the occupants did not have any effect.

Steppes . . . Rarely the smooth level surface of the plain is broken by the low hills of weed-grown mounds, *kurgans* or ancient burial places. There are no woods except for narrow strips along the rivers. We travel on for hours seeing nothing but collective farm fields. This steppeland stretches right down to the Sea of Azov.

On the seacoast we come to the town of Mariupol, where there is a fine fish market in which the fishermen sell the booty they have won from the rich, shallow waters of the Azov.

Mariupol is a big iron and steel center and an important seaport—the outlet to the sea for Donbas coal and Ukrainian wheat. Large quantities of coal leave Mariupol for Kerch in the Crimea, where a big iron mill smelts local ore that is found on the surface.

Not far from Mariupol, on the little river Kalimus, is the gigantic Azov Steel Works, one of the biggest plants in the south of the USSR. It was destroyed by the Germans but is now turning out iron again.

The Germans smashed all the port installations at Mariupol. Considerable effort is still required before the mechanized coal wharves assume their normal appearance. This work is now under way.

VI. THE MOTHER OF RUSSIAN CITIES

Our last trip took us across the eastern end of the Ukraine; now we are going to cross the republic a second time, journeying down the Dnieper, a river which plays the same part in the history and folklore of the Ukraine as the Volga does in the life of all Russia.

The Dnieper is third in length amongst the rivers of Europe. It runs north and south through the republic cutting it in two

from the Byelorussian frontier to the Black Sea. It passes through all the zones of the Ukraine—forest, wooded steppes, and open steppes. The Dnieper enters the Ukraine near Chernigov in the Polessye Region. On the podzol soil of this region there are mixed forests with frequent swamps.

Chernigov is one of the oldest towns in the USSR: the ancient chronicles mention it in 907. It is picturesquely situated amidst thick forests on hills overlooking the Desna River, the chief right tributary of the Dnieper. The timber houses—the town is surrounded by forests—make Chernigov more like the smaller Russian towns in the center and the northern parts of Russia than those of the southern Ukraine.

Above its confluence with the Desna, the Dnieper is narrow and comparatively shallow. The Desna gathers its waters in the damp forests of Polessye like the Dnieper's other right tributaries, the Pripet, and gives it that majesty which the Ukrainian poets sing of.

In the comparatively small forested region of the Ukraine the farmers plant rye, buckwheat, and potatoes. The fields and vegetable gardens alternate with forest masses. There are numerous villages: this is the oldest settled region of the Ukraine where the Ukrainians hid in the forests to escape the Tatars in the same way as the Russians hid in the forests of the Oka and Upper Volga.

As we continue down the Dnieper the country soon becomes more open. On the fringe of this open wooded steppeland, down-stream from the point where the Dnieper is joined by the Desna and the Pripet, rivers along which the Slavs spread outwards in ancient times, stands the city of Kiev.

Kiev is an ancient city; today it is one of the biggest centers of the USSR. In 1939 it was third in size (Moscow and Leningrad are bigger) and had a population of over 800,000. It is the capital of the Ukrainian Soviet Republic, a state whose area, population, and economic resources will easily bear comparison with, say, France.

Kiev has played a great role in history and today plays an equally important role in the development of Soviet culture. A thousand years ago Kiev was one of the most important cities of Europe, the capital of Kiev Rus, a big state which united the formerly scattered Slav tribes. When the Mongol invasion laid waste to the Ukrainian steppes and the villages hidden in the depth of the Polesse, and Chernigov woods came under the sway of the Poles, Kiev still remained the cultural center of the Ukrainians. Books were still printed in Ukrainian Slavonic, and in Kiev the Free Cossacks, persecuted by the Polish priests, preserved their center. From Kiev ambassadors set out for Moscow offering to join the Ukraine to the Russian State. The national leader of the Ukrainian people, Bogdan Khmelnytsky, fought for Kiev. Kiev, the "mother of Russian cities," has for a thousand years been the symbol of the friendship of the Ukrainian and Russian peoples.

After Kiev became the capital of Soviet Ukraine it grew by leaps and bounds. In the last few decades before the Revolution Kiev developed into a big provincial city, the favorite residence of the provincial landowners; under Soviet rule Kiev has again become the center of the Ukrainian culture, which the tsarist regime suppressed.

Before the Revolution Ukrainian culture was in a state of semi-legality: the beauty of the Ukrainian embroidery and of all the wonderful kerchiefs and towels was greatly admired, a national operetta was permitted, but these things were generally regarded as very nice but rather exotic and far from serious; the publication of literature in the Ukrainian language was not permitted at all and there was no real Ukrainian theater (neither drama nor opera); every interest in Ukrainian culture was regarded with suspicion by the police. The Ukrainian people with their rich historical past remained the same gifted and talented people with a constant creative urge. This tremendous potential that lay dormant for so long had opportunities to develop after the Revolution. Kiev became the center of Ukrainian cultural

development. In Kiev today there is a group of brilliant poets headed by Mikola Bazhan, there are prose writers and dramatists headed by Korneichuk; in a very short time the Kiev Franko Theater and the Kiev Opera House took up a leading position amongst the other Ukrainian theaters and are now amongst the leading theaters of the USSR. Rich museums were built up and Ukrainian science developed side by side with Ukrainian culture. The Ukrainian Academy of Sciences grew up in Kiev with its numerous research institutes, Kiev University extended its activities and about a dozen new pedagogical, technical, and humanitarian institutes were opened. Newly-built textile mills, engineering and chemical plants, and other big enterprises made Kiev an important industrial center.

To see Kiev at its best we had to visit it on the eve of the war when the reconstruction of the city was well under way. That is how we want to imagine the city, at the very height of its development. Today we see the terrible wounds that the German invaders inflicted on this beautiful city. Through the heaps of ruins which still stand on many of the central streets we shall look at Kiev, the beautiful, such as it was and such as it will soon be again when the loving labor of thousands of people have completed their work of restoration.

Kiev stands on high hills above the Dnieper and during the last pre-war years the rapidly spreading town crossed the river to the left bank. On the high cliff overlooking the river and near the center of the town there is a splendid park from which an extensive view is to be obtained. On the edge of the cliff stands a cross that was erected in memory of the baptism of Russia. Opposite, on the low, left bank of the river, there are far-spreading water meadows framed in the distance by a dense pine forest. On the slopes of the hills there are some fine orchards between the houses. The banks of the Dnieper are encased in granite and the streets of the city are lined with chestnut trees. The buildings of Kiev show great variety—monumental public buildings, splendid new dwelling houses ranging

from long blocks of three and four storeyed apartment houses on the central streets to tiny detached cottages with gardens and orchards on the outskirts. The streets are straight and cross at right angles, but without any monotonous regularity. Kreshchatik, the street which runs through the center of Kiev, is the most beautiful; on Kreshchatik are the best shops, cafés, concert halls, and office buildings. There is always a lively crowd on the streets and the soft sounds of the Ukrainian speech fill the air. The Opera House stands out in the center of the city; there are many fine old churches, especially the Cathedral of St. Sophia, built in 1037.

We have already said that Kiev, especially the central part of the city, suffered badly at the hands of the Nazis; beautiful Kreshchatik was completely destroyed. Although a considerable part of the city is still under reconstruction life goes on as usual. All the colleges, schools, theaters, the Academy of Sciences and others are working and many of the factories are already turning out their produce at the pre-war level. The population of the city, despite the heavy losses, (at the huge death camp of Babi Yar alone the Nazis murdered 180,000 civilians) is little less than that of pre-war. One of the outstanding features of the reconstruction is the correction of historical planning mistakes; this gives the ancient city a real modern aspect. The rebuilding of the city is not a mere mechanical reproduction of the pre-war city. Many of the streets and square will be much more beautiful than they were before. But the labor involved! . . .

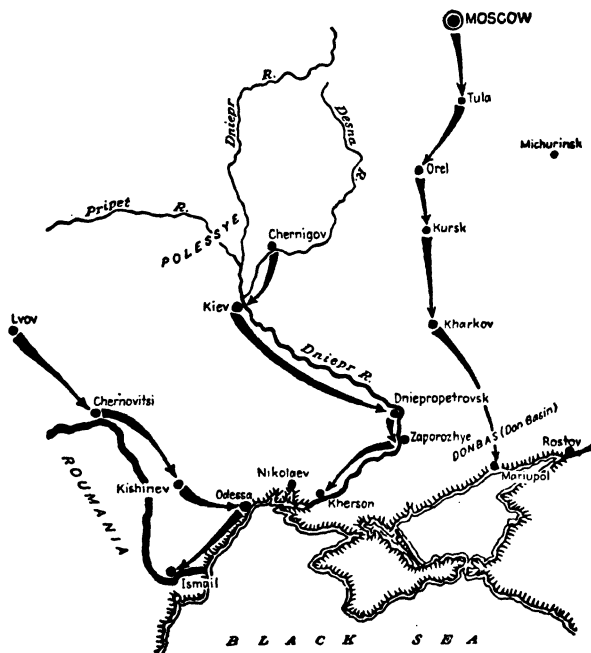
At the same time as the city is being rebuilt, Kiev is getting an underground railway and a gas supply.

VII. DOWN THE DNIEPER

BEYOND Kiev the Dnieper flows slowly and calmly spreading out to a great width and forming islands and backwaters. The hills on the right bank are a mass of rich orchards. On a high hill

at Kanova is the tomb of Taras Shevchenko, the national poet of the Ukraine.

The Dnieper flows on through the wooded steppe zone where the small forests form islands in the open steppe. This is the chief beet-growing and sugar refining region of the USSR; there



are more than 100 sugar refineries in this part of the Ukraine. Only part of these sugar refineries could be evacuated before the German invasion and those that were left behind were ruined. The refineries are now being rebuilt and some of them have already begun turning out sugar. Many hundreds of thousands of acres are planted to sugar beet in the Ukraine. Kiev region is famous for its big harvests of beet and the collective farmers

compete for bigger harvest yields; it is interesting to note that the bumper harvests of sugar beet rapidly become a mass phenomenon after each of these competitions. In 1945, 7,000 groups of collective farmers ("links" these groups are called in Russian; they form the basic organizational unit of the collective farms) undertook to gather bigger harvests of beet (from 12 to 24 tons to the acre): for comparison we may mention that up to 1932 the average for the Ukraine was $1\frac{1}{2}$ tons to the acre.

Our steamer overtakes rafts and barges of timber coming down the Dnieper from Byelorussia and Polesye to the treeless lands of the south.

The wooded steppe sector of the Ukraine contains the towns of Vinnitsa, Zhitomir, Poltava, and Sumy, all at some distance from the Dnieper.

The river sweeps past Cherkassy and Kremenchug and flows out into the treeless steppe where mostly wheat and barley are grown.

At the point where the Dnieper changes its course and turns sharply to the south and southwest there is a big industrial center which grew up in Soviet times. The river was formerly blocked by a rocky bar and the headlands of the stony cliffs stuck out far into the stream. The water raced and foamed over the rocks. Only the most experienced boatmen in tiny skiffs would venture amongst these rapids, guiding their craft from whirlpool to whirlpool. These rapids divided the Dnieper into two independent rivers, each with its own shipping.

The dam that was built across the river at Zaporozhye (the name means "Beyond the Rapids"), a ribbed, ferro-concrete wall half a mile long, raised the level of the river well over a hundred feet and formed a big lake. In 1932, when the dam was completed, the rapid disappeared far under the water. Locks were built that gave Kiev free access to the Black Sea. On the right bank of the river the Dnieper Power Station, the biggest in Europe (558,000 kwh) was built. This one station alone pro-

duced more electric power than all the stations in pre-revolutionary Russia.

The electric power from the Dnieper Power Station went north to Dniepropetrovsk, iron and steel center, west to Krivoy Rog and its iron mines, and part went to the neighboring collective farms, but the bulk of the power went to supply the big industrial center that grew up on the Dnieper in the vicinity of the station. The local products were iron and steel, aluminium, ferrous alloys, magnesium, coke, and building materials; the waste materials from one group of plants were used up by others.

The Dnieper Power Station and the Dnieper Industrial Combine were the favorite children of the Soviet people. The building of these giants excited the whole country, the press kept the people informed of every stage in the building of the power station and later reported the progress made by the industries that grew up around the station.

When the Red Army withdrew from this region in 1941, everything possible was removed. The equipment of the factories which formed the Dnieper Combine was re-erected in various districts deep in the interior of the country and formed the basis of a dozen new defence plants. The dam itself and the power station, however, could not be removed. The Soviet people, who had been so proud of what they built with their own hands, blew up the dam so that the Germans could not use the power it generated for their own purposes. Painful as this task undoubtedly was, it was done.

When the Fascists retreated from the Ukraine they destroyed whatever was left. Nothing was left of the Dnieper power station but a mass of rubble and twisted metalwork. The Dnieper power station has to be almost completely rebuilt. Work is well under way and the factories of the Dnieper Combine are being rebuilt together with the station.

Lower down the Dnieper there is a group of islands. At one time this labyrinth of islands was the headquarters of the free

roving Cossacks, the Zaporozhye Sech, immortalized in Gogol's wonderful tale of the Cossacks, *Taras Bulba*. The freedom-loving Ukrainian peasants fled to this strange Cossack Republic where they became free soldiers and lived a life of adventure and frequently gave their lives in the battles against the Turks, Tatars, and Poles. From the sixteenth to the eighteenth centuries the Zaporozhye Sech played an important part in defending the Ukraine against the Polish feudal lords and the Tatar Khans. Later the descendants of the Zaporozhye Cossacks colonized the Black Sea steppes.

Beyond Zaporozhye the Dnieper spreads over a wide area and has many backwaters. In spring extensive lands are flooded where in recent years rice has been planted.

The steamer is now approaching Nikopol, the manganese center. In these southern regions of the Ukrainian steppes a new crop has been introduced—cotton. The Soviet cotton belt was formerly confined to Central Asia and the eastern part of the Transcaucasus. Lately farmers have learned to cultivate cotton in much more northerly regions, in the North Caucasus, the Crimea, and the Ukraine. Upland cottons are grown here which do not require irrigation and are therefore cheaper. A textile industry is growing up in the Ukraine to use the cotton grown there. Nearer the sea the sandy terraces which form the banks of the Dnieper are planted out with vineyards. The warm southern winds already bring the smell of the salt sea to our nostrils.

Gradually the Ukrainian landscape has changed, step by step, to a typically southern countryside which bears no resemblance to the dense forests of Chernigov where we began our journey.

The Dnieper flows into the Black Sea near Kherson. Not far from here is Nikolayev, an important shipbuilding town. Kherson and Nikolayev are big grain exporters. Kherson has an interesting past. There was a flourishing Greek colony at the point where the Borispheh (the Dnieper) joined the Black Sea. This colony carried on trade with the Scythians, the ancient inhabitants of the steppes. Scythian articles bearing the obvious stamp

of Greek and Roman culture are still found in the burial mounds in the steppes.

VIII. FROM THE CARPATHIANS TO THE DNIESTER

THE route followed by our third north to south trip through the Ukraine gives us a very fine picture of the varied landscape zones and economic regions of the Ukraine. The trip down the Dniester takes us through regions that belonged to the Austro-Hungarian Empire until the First World War and afterwards to Poland, Czechoslovakia, and Hungary. The majority of the population of this region are Ukrainians who do not differ either in language or religion from the Ukrainians of Kiev, Chernigov, or Kharkov. Fate has sent the people of the western part of the Ukraine countless trials—oppression from the Austrian officials who ruled them, from the Polish and Hungarian landowners, and, lastly, the most terrible of all, Hitler's Gauleiters who cruelly suppressed every manifestation of national dignity. For centuries the western Ukrainians had dreamed of unity with the mass of the nation. This unification of the Ukrainians has taken place in our time. In 1939 the Ukrainian territories that formerly belonged to Poland joined up with Soviet Ukraine; in 1944, after the Hitlerites had been driven out, the people of Subcarpathian Ukraine were able to give expression to their desire to become citizens of Soviet Ukraine. In 1945 the final unification of the Ukraine was effected by a special treaty between the Soviet Union and Czechoslovakia; Subcarpathian Ukraine had been an autonomous unit of the latter republic until it was seized by the Hungarian Fascists.

That part of the Ukraine which runs into the Carpathians is a picturesque jumble of all types of country. The stern peaks of the Carpathians, some of them running to a height of 7,000 feet above sea level, are wrapped in mist, the gorges below them are filled with ancient firs; there are pleasant green valleys, espe-

cially on the southern slopes, with thick forests of deciduous trees including such real southerners as the poplar and the beech. Still lower down come the rich, densely populated black earth plains. These plains stretch from the Carpathians to the north-east, east, and southeast. In the north spurs of the swampy Polesye cut into the region with their pine forests growing on sand hills.

The Hutzuls, the Ukrainian Highlanders, who live in the mountains, have retained many picturesque patriarchal customs and have an ancient folklore that has long since disappeared in other parts of the Ukraine. Their herdsmen make use of an interesting musical instrument, a huge horn. They have very fine taste in the decorative arts as is seen in their embroidery, etc.

The plains of the western Ukraine have a warm, damp climate with fertile soil. Wheat, rye, barley are the chief crops, some sugar beet is planted, some tobacco and grapes are grown in the southeast. Cattle are pastured in the mountains. Cottage industries are highly developed.

Amongst the foothills of the Carpathians there are petroleum, combustible gas (a pipe-line is being built to take this gas to Kiev), potassium, salt, coal, earthwax, phosphorites, marble, and copper. There is valuable timber in the forests.

The fact that the west Ukrainian districts have only been part of the USSR for a comparatively short space of time gives them a special appearance. Many of the things that have become normal in the other parts of the Ukraine and throughout the USSR, are only just beginning here. The Machine and Tractor Stations set up by the state are becoming very popular amongst the peasants and are the basis of the technical transformation of the farms. Industries which were at a low ebb before the unification are now being developed.

Lvov is the center of the western Ukraine; it is situated on the picturesque hills of the divide between the basin of the Dniester and the Western Bug, on the ancient trade route from the Black Sea to Western Europe. In the thirteenth-century chronicles

Lvov is mentioned as an important city in the Principality of Galicia. Lvov was later seized by the Poles and in the eighteenth century passed over to the Austro-Hungarian Empire. Despite all this Lvov has remained a truly Ukrainian cultural center. Before the Second World War the town had over 300,000 inhabitants and engaged in a number of small manufactures (food processing, clothing, and metal goods). The old University in Lvov is an important research center. Outwardly the town of Lvov has retained much that belongs to medieval Western Europe—narrow streets, steep Gothic roofs, the ancient town hall, cathedrals that look like Catholic chapels; there are many beautiful memorials.

Lvov is one of the most beautiful towns in the Ukraine. Today life is returning to the town after long years of Fascist rule.

From Lvov we may go on to Chernovitsi, the center of Bukovina. Bukovina—the Land of Beech Trees—is a hilly country, Ukrainian in custom and culture.

To the south of the Dniester lies the Volynsk-Podolsk Highlands, a hilly plateau where there are wheat fields, sugar-beet plantations, and orchards between the stretches of forest. The Dniester flows through a narrow valley. Further south we come to black earth again; here the chief crop is maize with occasional vineyards. Here we will cross the Dniester into Moldavia.

IX. MOLDAVIA

THE northern part of Moldavia bears great resemblance to the Western Ukraine. On the right bank of the Dniester stands the small town of Soroki almost hidden in the surrounding orchards. The town is in a picturesque amphitheater, which opens out to the river and the orchards merge into endless forests of hazel and acacia on the hillsides. The white houses, quiet streets, and abundant greenery of Soroki bring the southern health resorts to mind. From Soroki we can travel the whole length of Moldavia by car.

The road plunges immediately into a chain of rather steep hills that seem to be crowding into the Dniester, then it falls on to a wide undulating plain almost every square inch of which is cultivated. This is the Beletskaya Steppe which produces most of Moldavia's wheat.

The vagaries of fate have kept the Moldavian people in a difficult position until quite recently. The Moldavians took form as a nation in the Carpathian part of Transylvania, in the Maramures Region. In the fourteenth and fifteenth centuries they began to settle the region between the Dniester and the Pruth, the region that later became known as Bessarabia. At the beginning of the sixteenth century Moldavia formed into a strong state whose lands stretched from the old capital of Suchava to the Black Sea. The Moldavian people are still proud of their ruler Stefan the Great, who in this period defended Moldavia against her militant neighbors, the Hungarians and Poles. When the herds of Turks poured into the Balkans they subdued the free Moldavia plains. Turkish rule lasted three hundred years: the Turkish Sultans gave over the Moldavian plains to their Tatar allies to plunder. The Moldavian rulers and the Metropolitans of her Church appealed to their co-religionists, the Russians, for help. Russia, however, was only able to liberate Moldavia from the Turkish yoke after she herself had regained the shores of the Black Sea. In 1812, after a number of liberation campaigns into the Balkans, Turkey was compelled to cede Bessarabia to Russia. The region rapidly began to improve, the rich steppes were plowed up and Bulgarian colonists from across the Danube came into the country. The Russian railways built in Bessarabia helped develop the country by providing direct transport for Bessarabian grain, fruits, and wine to the Russian market.

Taking advantage of the difficult situation of Soviet Russia the Rumanian imperialists occupied Bessarabia in 1918. The resistance of the Moldavian people was suppressed. Only a small territory inhabited by Moldavians on the left bank of the

Dniester remained in the USSR. This territory, in accordance with the Soviet national policy, became the Moldavian Autonomous Republic which formed part of the Ukrainian Soviet Republic. Bessarabia passed through a period of economic depression, the urban population dwindled and viniculture, the chief industry of the central and southern regions, was on the decline; poverty and unemployment were rife. In 1940 the Soviet government demanded the return of Bessarabia and right-bank and left-bank Moldavia were united in the Moldavian Soviet Republic, a constituent republic of the Union. The period of rest from occupation did not last long and a year later Moldavia was again invaded. In 1944, when the Red Army drove the Nazis out of Moldavia, the restoration of the Republic's economy really began; this time it was a much bigger task, for the towns had been wrecked, roads and bridges blown up and the orchards had been felled.

Leaving behind us the Beletskaya Steppe and the little town of Beltsy on the River Reut, we enter the Kodry, the central region of Moldavia. Kodru in Moldavian means "forest" and here, long years ago, there were once dense forests which covered the steep hills which even today, after the forests have become thin patches of trees, give the countryside a sort of mountainous aspect. Hidden away in the valleys are the ancient Moldavian villages and many famous monasteries that were founded between the sixteenth and eighteenth centuries. The Kodry today is the most highly developed grape-growing region of the republic. The slopes of the hills, especially the southern slopes, are almost completely covered with vineyards. Bullock carts carry huge casks of wine along the Moldavian roads. The local wines are mostly of the cheaper, simpler varieties, but the better sorts of grapes that have been imported from Western Europe are gradually gaining a foothold. Over half the vineyards in the USSR are already concentrated in the Moldavian Republic and as these develop, the country bids fair to becoming a grape-

growing center of world importance—the Soviet Champagne. The soil and the climate both favor grape-growing on a large scale.

Moldavia has a pleasant and picturesque landscape. The sun is warm and consistent, the winters are short and mild, the snow lies on the ground for a few days only. The villages are big, the mud-built cottages resemble those of the Ukraine, although they are larger, they are roofed either with tiles or maize straw thatch; shingle roofs are to be found in the wooded regions. Maize plays an important part in the life of the Moldavian peasant: it is sown over an area as great as that of the wheat fields. The stalks of the plant provide thatch and fences; the national dish is *mamalyga*, a sort of pudding made from ground maize. Large quantities of fruit are grown in the villages.

MOLDAVIAN S.S.R.

Territory: 13,000 sq. miles.

Population: 2,700,000 (estimate of 1941). Majority Moldavians, but large number of Russians, Jews, Ukrainians, and Bulgars. *Neighbors:* North, east, south—Ukraine. West—Rumania.

Relief: Hilly plain. Highest point Mount Megura in the Kodry (1,400 ft.).

Chief Rivers: Dniester, Pruth (shared with Rumania), Reut (not navigable).

Produce: grapes, maize, wheat, fruits, nuts, wool, phosphorites, building stone.

Region of Russia since 1812 (left bank regions since 1792).

Soviet Republic since 1940; left-bank Moldavia became part of the Ukraine in 1919 and an Autonomous Republic in 1924.

Capital: Kishinev.

Kishinev, the capital of the Moldavian republic, lies to the southwest of the Kodry, at the point where the plains again begin to predominate. The small but picturesque river Byk flows past the town. The town itself is sharply divided into two parts. The lower part near the river Byk lies around the railway station

(it was destroyed by the Germans); here there are the flour mills and a number of industrial enterprises. The streets are narrow and were formerly the home of the poor of Kishinev, many of them Jews. The poor people formed the majority of the population of Kishinev. The upper part of the town occupying the level area on the slopes of the hills, was built chiefly by the merchants when Kishinev became the commercial center of Bessarabia at the end of the nineteenth century. The streets are straight and cross at right-angles. Alexanderovsky Prospect, the main street, contained splendid buildings most of which are now charred skeletons. The famous Kishinev Cathedral was also damaged by the Germans. There is a public park with a memorial to Pushkin who lived four years in exile in Kishinev; on the Prospect there are also the government offices, some colleges, research institutions, and the town's best shops. The pleasant-looking side streets contain mostly one- and two-storey houses; they are closely planted with trees beneath which a lively southern crowd is to be found on any summer evening. The Kishinev market where the local peasants bring their produce for sale is another scene of bustle. The items in greatest abundance are fruit both fresh and dried (the Bessarabian prunes are delicious!), nuts and, of course, wine.

The middle and lower reaches of the Dniester differ greatly from the upper reaches. Below Soroki it leaves the narrow valley and spreads over the plain. Its banks are low and in places are overgrown with reeds and willows. The soil here is subject to frequent floods and is rich in humus. The rich lands of the Dniester backwaters are intensively cultivated for vegetables and melons; the harvests are astronomical. A little farther away from the river there are the orchards which run in a long, closely planted strip parallel to the Dniester. The gardens and orchards are irrigated with the waters of the Dniester and the numerous old riverbeds that are filled with water only at flood times. Big, rich villages form an endless string along the river, especially on the left bank. Still farther from the river is the next cultivated

strip—the vineyards which occupy the slopes of the hills. The plain which is slightly higher than the floodlands is sown to grain. The cornfields are farthest of all from the source of water.

The Dniester villages are inhabited by Moldavians, Ukrainians, and Bulgars, all of them fine vegetable and fruit growers.

As we travel slowly down the Dniester it is interesting to compare the farming on the left and right banks. The left bank, where the Moldavian Autonomous Republic was founded in 1924 is a land of collective farms. With the aid of the state the left bank Moldavians obtain huge harvests of vegetables, fruit and grapes; in Tiraspol, the capital of the Moldavian A.S.S.R. from 1924 to 1940, there are a number of big canneries, jam factories, fruit preserving plants, and wineries. On the right bank the peasants still farm their own lands. Existence under a foreign state for over twenty years has left its mark on the farms. Even from the river we can see that the orchards and vineyards are farther apart and the villages smaller and poorer.

Southern Moldavia is steppeland, hilly nearer Kodry and flatter near the sea. This is the western end of the same Black Sea steppes that we passed through at Mariupol and Kherson. The farmers of the plains plant maize and wheat, fruit and grapes and breed sheep. The summers are hot and the rivers flowing from Kodry to the Black Sea—Yalpukh, Kogilnik, Yalpuzhel and others—are small and frequently dry up; the ravines of the steppes are also dry most of the year. At some crossroads wells have been dug, an act of grace on the part of the kindly Moldavian peasants.

All over Moldavia we come across Ukrainian villages as well as Moldavian; there are also many Jews and Russians and some Gypsies living in the Republic. There are more nationalities living together the farther south we go. Here are the populous settlements of the Danube which once sought Russian aid against the Moslems. There is little in the architecture, manners, and customs of the villages to distinguish them from the Moldavian, but still they are Ukrainian. As we travel from village to

village we notice the frequent change of language. In the Moldavian the Latin roots have become strangely intermixed with the Slav. The Moldavian language changes to the soft, musical Ukrainian and then to the broad, consonantal speech of the Bulgarians. We should not be surprised if we even hear French spoken for nearby, at the mouth of the Dniester, there is a colony of people who came from the French part of Switzerland: Chabot was founded over a hundred years ago and its inhabitants are excellent grape growers who brought with them better quality vines and an improved technique; Chabot at one time played an important part in improving this branch of agriculture in Bessarabia.

X. THE BLACK SEA AGAIN

NEAR the point where the Dniester enters the Black Sea, but in the Ukrainian Republic, stands the town of Odessa, a beautiful and busy seaport with food packing, chemical, footwear, rope and jute, and engineering industries. Before the war Odessa was the third town of the Ukraine (after Kiev and Kharkov). There are many seaside health resorts in the neighborhood of Odessa. A magnificent, wide stone staircase leads from the city to the harbor, one of the best in the USSR. At the top of the staircase is a statue of the Duke of Richelieu, one of the royalist *émigrés* who entered the Russian service at the end of the eighteenth century after the French Revolution. Richelieu was a fine administrator and he was sent by Catherine II to administer the southern seaboard of the Ukraine ("Novorossia" or New Russia), that had just been regained from the Turks. He did a great deal towards building Odessa which became a first-class port in his time. Most of the Odessa buildings are made of sandstone; the stone is soft and easy to work but will not stand great pressures so that the buildings are comparatively small, mostly three and four storeys. The streets are straight and wide and most of them are lined with white acacias. The Odessa theater is the

finest building in the town and closely resembles the famous Vienna Opera House. Many outstanding men of arts and letters have come from Odessa.

The Fascists did a great deal of damage to this fine seaport. They showed all the brutal savagery of their nature in Odessa. Two hundred and eighty thousand civilians, mostly Jews, who together with Russians and Ukrainians formed a large part of the Odessa population, were brutally murdered. Many of the dwelling houses, the water mains, all the industrial enterprises and the port installations were destroyed. It will not be easy to heal these gaping wounds.

West of Odessa lies the Ismail Province, a steppe region of Bessarabia, where wheat, maize, grapes, and vegetables are grown. Ismail is very similar to southern Moldavia and its historical fate is also comparable to that of Moldavia. The sea has bitten deeply into the steppes forming lagoons separated from the sea by sand bars. This region is inhabited by Ukrainians, Russians, Moldavians and Bulgarians. On account of the fact that the greatest number of inhabitants are Ukrainians it was included in the Ukraine and not in Moldavia after it was ceded by Rumania in 1940. There are many big villages surrounded by orchards in the steppes. The chief towns are Belgorod-Dniestrovsky (Akkerman) and Ismail.

At one time Ismail was a big Turkish fortress. In 1790 the Russian Army under Suvorov took the fortress by storm and astonished the whole of Europe.

4. THE NORTHWESTERN SEAS

I. THE GUARDIAN OF MOSCOW

THE NORTHWESTERN PART of the Soviet Union, Byelorussia and the Baltic Republics, was captured by the Germans during the first few weeks of the war as a result of the suddenness of their attack. About a fortnight after the outbreak of war the noose tightened around Leningrad.

We shall see the same as we saw in the Ukraine and Moldavia, throughout the whole of this region—ruined towns, devastated villages, streets of houses burnt down, huge concentration camps for civilians, death from torture for the Jews herded into the ghettos, hunger at home or slavery in Germany, horror, and ruin. With the results of the war so much in evidence, although it will not be easy for us to imagine the northwestern part of the Soviet Union as it was under normal circumstances, we shall try to do it. We shall make our imaginary journey under pre-war conditions and only pause to examine the ruins of war where they are of such a nature that the rehabilitation means long and persistent labor.

All roads in the USSR begin from Moscow. All the streets leading out of the city begin at the center or hub.

From time immemorial a road has led from the Kremlin to the northwest, to Tver. Moscow expanded and the old road developed into a city street—Tverskaya. Today the street bears

the name of Maxim Gorky. On the outskirts of the city it widens to become one of the great arteries, the Leningrad Chaussee, which runs through Tver (now called Kalinin) direct to Leningrad.

We shall begin our journey with Byelorussia, however.

The road to Byelorussia leads through the western regions of the R.S.F.S.R., the road along which Napoleon marched on Moscow in 1812, the road along which the Germans tried to reach Moscow in 1941. At first we pass through a number of small towns—Ruza, Vereya, Mozhaisk. Each of them with its sixteenth-seventeenth-century churches and its fortified monastery walls is like a little museum of history, or rather it was, for the Nazis destroyed many historical monuments and razed these towns to the ground.

After we pass Mozhaisk we see the monuments on Borodino Field from the train windows, a place sacred to every Russian. It was at the battle of Borodino, to quote Napoleon himself, that "the French showed themselves worthy of victory and the Russians earned the right to be called invincible."

Next we come to Vyazma, a big railway junction. The line drops down to the upper reaches of the Dnieper which it follows to Smolensk.

As early as the ninth century Smolensk was a big town on the old Slav waterway from the Baltic to the Black Sea. Smolensk was the "guardian of Moscow," as it stood on the way to the capital. Smolensk saw the first great battle which the Russians fought against Napoleon's troops; Smolensk also experienced the horrors of the Nazi invasion. The lands of Smolensk, "Smolenshchina," always returned to the Russians. These are memorable, historical places, venerated by all Russians.

The main part of the town of Smolensk lies on the steep left bank of the Dnieper; in the spring the river is navigable and Dnieper steamers and barges go right up to Smolensk. In the town there were the ancient, moss-grown walls of the Kremlin, many old churches and business premises of great age. Fac

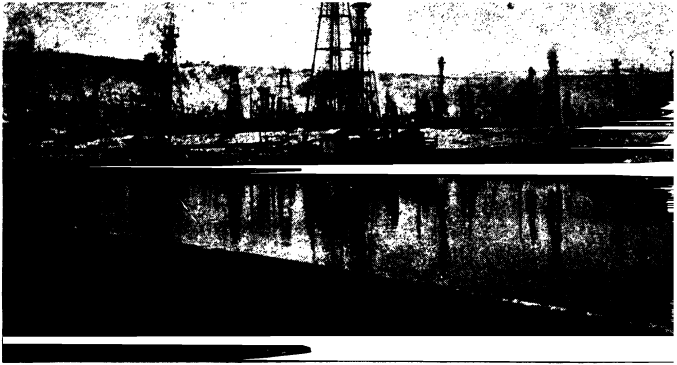


PAST AND FUTURE

ABOVE:—View of Leningrad, showing (foreground) the equestrian statue of Peter the Great.

BELOW:—Planning the reconstruction of Stalingrad, all but destroyed during a gallant defense.

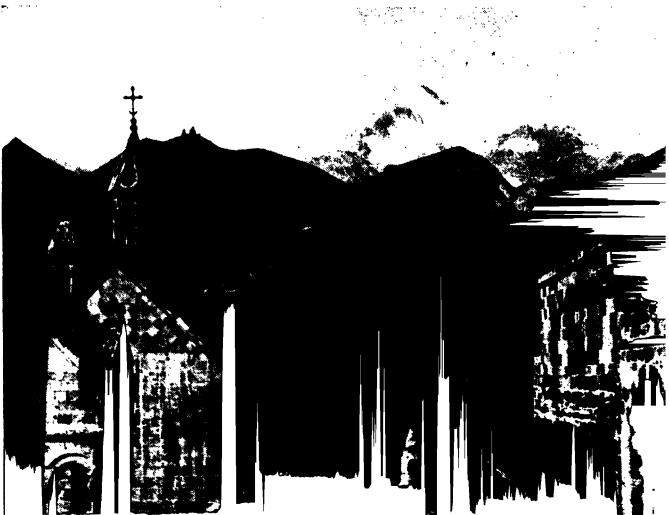




NEW AND OLD IN THE CAUCASUS

ABOVE:—Oilfields at Baku, one of the objectives of the German attack on Russia.

BELOW:—On the Georgian Military Highway. In the background the snow-capped peak of Mount Kazbek.



tories were built there in Soviet times, amongst them a big linen mill. The Germans left Smolensk in such a state of ruin that it will have to be built anew.

We note that the farther we travel to the west, the greater the number of deciduous trees in the forests. One of the main crops in the fields along the railway is flax; we are now crossing the great flax belt of the USSR. On all sides we see field after field of the tiny blue flowers of this plant. The whole region lives on the flax which supplies local linen mills and provides an important export commodity. The flax harvest, although scientific farming methods are now employed, still depends to a considerable extent on the summer rains; flax needs a temperate damp climate with a mild summer, that is the climate of Smolenshchina.

II. MINSK

Soon after we leave Smolensk we cross the frontiers of the Byelorussian S.S.R. Here begins the land of the Byelorussians, an East Slav people. The road to Minsk, the capital of Byelorussia, runs almost due east and west. In the USSR the farther west we travel the moister and milder the climate. Compared with the central regions of the USSR the summers here are cool and the winters warm. When there is a light frost in Moscow there is usually a thaw in Byelorussia. It sometimes happens that there are thaws in midwinter, the ice on the rivers melts and the water overflows their banks. In the plains there are swamps. In the villages there are board sidewalks to the streets and the old roofs and fences are covered with green moss. In the forests the firs and pines are mixed with maple, linden and, in the south, hornbeam. Storks nest in the trees.

BYELORUSSIAN S.S.R.

Territory: 86,000 sq. miles.

Population: about 10,000,000.

Neighbors: East—R.S.F.S.R., North—Lithuania and Latvia;
West—Poland, South—Ukraine.

Relief: Plains, with depressions in many places. Moraine in the north.

Chief Rivers: Dnieper with its tributaries Sozh, Berezina and Pripet; Nieman, Western Dvina.

Region of Russia since 1773 (eastern part), 1795 (western part).

Soviet Republic since 1918.

Capital: Minsk.

Orsha is the first big Byelorussian city we pass on the road to Minsk. All around the city there are forests of fir trees and peat bogs. Peat is the chief fuel in Byelorussia and in Soviet times a number of big electric power stations have been built which use peat under their boilers. Many small power stations use the same fuel. The Germans destroyed them all, but the Byelorussians are well on the way to rehabilitating them.

At Orsha the railway leaves the Dnieper which now turns south. At this point it is still quite a small river; we have to go much farther south, towards the borders of the Ukraine before it becomes the wide, majestic river we saw on our last journey.

After leaving Orsha the railway runs through frequent woods with flax fields in between. Nowadays the huge flax fields are cultivated and reaped by machinery and the retting of the flax and all the other preliminary processes are done mechanically by industrial concerns. We also find hemp, potatoes, and fodder grown in the Byelorussian fields. Although the farms in these regions specialize in industrial and fodder crops the acreage under wheat is gradually increasing.

Very soon our train crosses the Berezina, a right tributary of the Dnieper. This is another historical spot. Not far from the railway bridge the remains of the French redoubts were still to be seen a few years ago. It was here in November 1812 that Napoleon almost lost the remnants of his army in crossing the river on his retreat from Moscow. In the summer Napoleon crossed the Russian frontier with 533,000 soldiers, in the winter

of the same year he went back with about 18,000. As we cross this land so recently liberated from the Germans by the Red Army we recall the lessons of history.

The Berezina comes from the north from the depths of dense, virgin forests. One of the commonest trees in these forests is the aspen which provides the best wood for matches. Before the war Byelorussian matches were popular all over the Soviet Union. The factories are now being rehabilitated and the match industry will soon be producing again.

Minsk is situated at the confluence of the Svisloch, a tributary of the Berezina, and the Nemiga. Today the Nemiga is a scarcely perceptible stream, but in the past it was a big river. It is mentioned in one of the earliest Russian literary works, *The Lay of Igor's Host*, which describes it as the scene of a fierce battle where "the bloody banks of the Nemiga were sown with bones of Russia's sons."

In old Minsk the stone Town Hall with its clock and the Cathedral with two belfries on either side of the façade towered over the narrow crooked streets, lined with gray, poverty-stricken hovels and the Jewish ghetto that had remained from the Middle Ages. After Minsk became the capital of the Byelorussian Soviet Republic, its complete reconstruction was undertaken. The streets were straightened and asphalted, tramlines were laid and whole blocks of new houses were built. Amongst the new buildings the Government House, the Red Army House, and the University City were prominent. The research institutes of the Byelorussian Academy occupied a large group of new buildings. The light industries were expanded and an important engineering industry developed in Minsk.

In general Minsk became a splendid modern city, the worthy capital of a big republic whose territory is only slightly less than that of Great Britain and whose population is almost as great as that of Canada.

Before the Second World War there were 239,000 inhabitants in Minsk. As a result of the German invasion, the city was

almost entirely destroyed. The old timber houses were all destroyed during the first air raids: the big new buildings were all deliberately blown up by the Germans. The work of rehabilitation is making great progress in Minsk and the government of the USSR is helping the Byelorussians restore their capital.

III. THE LAND OF THE BYELORUSSIANS

WHEN Byelorussia formed part of the Russian Empire, it was a poverty-stricken, backward region. The peasants had tiny plots of land and many of them had no land at all. Its industry was very low.

After the Revolution that part of Byelorussia which remained in the Soviet Union developed very rapidly into a republic with important industries and modern collective farms. Naturally, the fact that the Byelorussians for the first time in history were able to set up their own state and freely develop their own national culture played an important part in this general progress.

The western part of Byelorussia which formed part of Poland from 1920 to 1939 suffered a different fate. The country was dead for twenty years, it not only remained in its old backward state but the reactionary government of Poland oppressed the Byelorussians and destroyed their culture.

In 1939 the Byelorussians living on the two sides of the artificially demarcated boundary joined hands again. The poor peasants and farm laborers were given the land which the Soviet government nationalized. In the backward provincial towns of Pinsk, Lida, and Baranovich industries began to develop. This revolution in the life of western Byelorussia was interrupted by the Nazi invasion.

Byelorussia together with its new provinces became part of the penal colony which the Germans called Ostland. The Germans drove off 300,000 civilians, mostly young people, to slavery. In the western regions the Germans took away the land that the Soviet government had given the poor peasants and laborers.

In this region the invaders set up 1,200 colonial farms, making virtual slaves of the peasants. In the villages of Byelorussia the Germans burnt down 300,000 peasant homes.

The Jewish population suffered worst of all in both the western and eastern districts of Byelorussia. There were many Jews in both parts, for the "Jewish settlement region" which was the only place Jews (with a few exceptions such as merchants, lawyers, doctors, and pharmacists) were allowed to live before the Revolution, included Byelorussia and the southwest Ukraine, 15 governments out of the 73 in the Russian Empire. Even within this region the Jews were only permitted to live in the towns. It therefore follows that the Jews were forbidden to engage in farming. There were many small tradesmen, almost one shoemaker or tailor to every five people. As the market developed, the artisans had to deal with the predatory middle man who bought up their work instead of the old patriarchal client. There were no factories for the artisans to go to and the buyer ruined the artisan, the big shop keeper ruined the little man.

Such was the horrible life the inhabitants of the *mestechko* lived before the Revolution: the *mestechko* was not a village and at the same time it was not a real town. Most of the Jews lived in these *mestechkos*—groups of ramshackle cabins around a synagogue. Ragged children roamed the dirty streets. The people of the *mestechko* did not know how to live, to what to apply their labor.

When the equality of the people was established after the Revolution, there were no "step-children" and the problem of the *mestechko* ceased to exist. Industrialization found a use for skilfull hands of the Jewish artisan. Amongst the workers in Byelorussia's newly founded industries there were tens of thousands of Jews who formerly lived in the *mestechkos*. The artisans formed themselves into co-operatives and Jewish national culture was able to develop freely.

The Hitlerites doomed the whole Jewish population of Byelo-

ruSSia to death. They slaughtered hundreds of thousands of Jews and drove the others into dismal ghettos to await their doom. The few who lived until the arrival of the Red Army came out from behind the barbed wire gray-headed old men and they had been gay youths when they first went there.

Our route has taken us across Byelorussia from east to west, now let us make a trip from south to the north.

The railway running from Odessa to Leningrad passes through the eastern part of Byelorussia. Let us travel by this route.

We begin at Gomel in the very south of Byelorussia. The town stands high above the Sozh, a tributary of the Dnieper. From the center of the town there is a park running downhill to the river; one feels the southern atmosphere in the streets, there are acacias, pyramidal poplars, and houses with balconies. The park was badly damaged by the Germans.

During the last few years before the war Gomel and its suburb Novobelitsa became an important industrial center. The chief produce was farm machines (especially those used for the cultivation of flax and potatoes), furniture, matches, and chemicals. Paper and glass were also made in large factories near Gomel. The Nazis destroyed eighty per cent of this town.

To the west of Gomel lies the Byelorussian sector of Polessye, a huge swampy depression which forms the basin of the slow-flowing Pripet. It has dense forests, mostly the hardy aspen. On the higher ground of the sandhills there are pine woods which give Polessye something of a northern aspect. There are many lakes with marshy banks. The lowest part of the country is a mass of reeds and sedge. In spring the swamps are flooded forming an expanse of water so that communication between the villages on the higher ground is only by boat.

Intensive drainage operations are under way in Byelorussia that are not only drawing off the surface water but the subsoil water as well. The soil that remains after draining is rich in organic substances and produces bigger harvest than other lands.

The rubber-bearing kok-sagyz has become an important crop in Byelorussia.

A glance at the map will show us that Byelorussia is the divide between two big river systems, the Baltic and Black Sea systems. The Western Dvina and its tributary the Shara, the Western Bug (tributary of the Vistula), the Pripet and the Berezina (tributary of the Dnieper) have their sources close together. Early in the nineteenth century an attempt was made to connect them by a canal. Canals linked up Pinsk (on the upper reaches of the Pripet) with Brest (on the Western Bug) and Grodno (on the Nieman). The Berezina Canal linked up the Dnieper and the Western Dvina. The canals were all small and of little economic significance. Artificially established frontiers cut up a region that is geographically one: the lower reaches of the rivers flowing into the Baltic were in Poland and the Baltic republics. Naturally under these conditions the canals lost any little importance they had had and there was no stimulus to rebuild them. There is now every reason for these waterways to become important means of transport. Before the war some big engineering jobs were begun.

As we leave Gomel in a northerly direction the train passes through the orchards of Southern Byelorussia. Before the war fruit-growing had developed on a large scale and some 125,000 acres of collective farm lands were laid out as orchards; they were planted with the best Michurin varieties. The Nazis cut down millions of trees, sent saplings off to Germany and destroyed the hothouses and experimental stations. The people of Byelorussia regard the rehabilitation of the orchards as an important state duty. The Byelorussian government has decided that the area planted to fruit trees is to be increased to 300,000 acres in the next ten years which will provide from one and a half to two million tons of fruit a year. Orchards will be planted at schools and hospitals and eight million fruit trees will be planted along the roads.

As we go north the forests change rapidly—more conifers and fewer deciduous trees. We pass Mogilev on the Dnieper, cross the Moscow-Minsk line at Orsha where we have been before until we cross the Western Dvina at Vitebsk. The town stands on high hills over the deep river. Most of the Vitebsk people are employed in the knitted goods, linen, and clothing trades; eyeglasses and needles are also made at Vitebsk. One hosiery factory in Vitebsk in the pre-war days turned out more produce than all the Byelorussian industries before the Revolution. Over ninety per cent of Vitebsk was completely destroyed.

In the plains near Vitebsk there are hilly ridges; in the forests and swamps there are many lakes. The ridges and the lakes which we can see from the train windows are the results of the activity of an ancient glacier which once stretched from the Scandinavian Mountains to Byelorussia; these are the moraines on the fringes of the ice cap during the great ice age. The moraine can also be recognized in the low, long hills, the numerous gullies in the fields and in the large number of deep depressions in which lakes have formed.

IV. ALONG THE NIEMAN

FROM Vitebsk it is only a short train journey to the Lithuanian Soviet Republic. Vilnius (Vilno) the capital of Lithuania, is quite close to the frontier between the two Republics. It is also the junction of two important railways, one from Leningrad to Warsaw and the other from the Ukraine to the ice-free ports of Lepaja and Koenigsberg. Two rivers flow around the city, the comparatively big Viliija, a tributary of the Nieman and the tiny Vilejka. From the surrounding hills we get a bird's eye view of the city: its narrow winding streets are a mass of little wooden houses crowded on top of each other; hidden by the clumsy bulk of the richer brick houses, there are numerous churches, synagogues, and town halls—the very planning of the city tells us its age. Vilnius was already the capital of Lithuania under

Gedemin in the fourteenth century. In the subsequent centuries when the Lithuanian Princes became the Kings of Poland, Vilnius came greatly under the influence of Western Europe from whence it imported the Magdeburg Law which gave the burghers a number of privileges in those feudal times. Vilnius has an old University which developed out of the Jesuit college in the sixteenth century. The medieval west and catholicism gave Vilnius a large number of Gothic churches. The sections inhabited by poor Jews are strangely interspersed by these Catholic churches. In the suburbs of Lukiski, Spiciski and New Town there are many co-operative workshops belonging to artisans; there were also a number of big factories in Vilnius.

LITHUANIAN S.S.R.

Territory: about 24,000 square miles.

Population: estimated at nearly 3,000,000 in 1940; mostly Lithuanians, many Byelorussians, some Jews.

Relief: Moraine plains with flat hills: average altitude 350 feet above sea level.

Chief Rivers: Nieman and its tributary Viliija.

Region of Russia since 1788 (the main part of the country).

Soviet Republic since 1940. (Soviet power was established in 1918 but lasted only a few months). A constituent republic of the USSR since 1940.

Capital: Vilnius (Vilno).

During the past thirty years Vilnius has known many vicissitudes. From 1918 to 1920 the city changed hands many times passing from local supporters of the Soviets who formed the Byelorussian-Lithuanian Soviet Republic to the Poles and to the Red Army. In 1920, when the war with Poland ended, the Red Army handed the Vilnius Region over to Lithuania but a short time later imperialist circles in Poland seized the city and the surrounding region by force of arms. The Polish-Lithuanian dispute over Vilnius lasted many years and at times became very acute. Lithuania made several attempts to regain her capital

by appeals to the League of Nations. The USSR consistently supported Lithuania in this dispute on the basis of the predominant Lithuanian population of the city and Lithuania's historic right to Vilnius. In 1939 Vilnius came over to the Soviets together with the western districts of Byelorussia and for the second time the USSR handed the ancient Lithuanian capital back to its rightful owners. Vilnius again became the capital of Lithuania: it remained the capital in 1940 when the republic changed its system of government to the Soviet system and entered the Union. Since that time Vilnius has taken on a new lease of life: it has changed from a provincial, disputed town of Poland into the capital of an important Soviet Republic. Progress was interrupted by the German invasion when Vilnius was very badly damaged.

From Vilnius it is not far to Kaunas which until the return of Vilnius was the temporary capital of Lithuania. The country is a plain of moraine formation. The woods that once covered the whole of Lithuania have become much thinner but still form a very noticeable feature of the landscape. There are trees of all kinds but firs, alders, and birch predominate. The chief grain crops are oats and rye. The villages are of medium size and there are many isolated farmsteads. Rural architecture is simple, log cabins, wooden fences, and board roofs. Although agriculture predominates over industry in Lithuania it is not at a very high level. The war checked the progress that was already being made. The Lithuanian government has now organized several hundred Machine and Tractor Stations and these will help raise the general level of agriculture. The livestock farms that were much more highly developed before the war lost a considerable part of their herds: pig-keeping was also important and will, of course, be more easily restored to its former level.

Kaunas (Kovno), an important town, stands amid thick woods on the right bank of the Nieman. It is an old town but smaller than Vilnius. It did not play a very important political

role in the past, is more modest in its architecture, there are fewer churches and palaces and the town market buildings are poorer. A few modern bank and office buildings were erected during the time when Kaunas was the capital: there are some light industry enterprises.

The Nieman falls into the Baltic in the Kurishes Haff which is separated from the sea by a sand spit over 60 miles long. In the extreme south is the town of Klaipeda (Memel), once Lithuania's only port which was seized by the Germans in 1939. The capture of Memel was the first step in the new *Drang nach Osten* which ended in such miserable failure. Klaipeda (Memel) is again a Lithuanian seaport.

V. THE RIGA LITTORAL

Our journey now takes us across the northern part of Lithuania to Riga, the capital of the Latvian Soviet Socialist Republic. The northern part of Lithuania differs but little from the part we have already seen, the same moraine plain where woods and fields with deep gullies alternate. The towns are small (the only biggish town that we pass is Siauliai) and the villages, diminutive; lonely farmsteads are frequent. On all sides we see the destruction wrought by the war.

The frontier between the two republics is formed by a big moraine ridge; just across the border our train runs into the important junction of Jelgava (Mitava), a junction where six railways meet and which is, therefore, bigger than Riga itself.

Jelgava lies in a very considerable depression after which the country drops steadily down to the valley of the Western Dvina, the chief river of Latvia (the local name for it is the Daugava).

The railway which runs due west would take us to Kurland, the seaboard province of the Latvian Republic occupying the peninsula between the Baltic and the Gulf of Riga. The center of the peninsula is formed by the Kursem Highlands, the high-

est points of which are not much over 600 feet. There are several seaports, the most important being Lipaja (Libau). Lipaja unlike the more northerly Baltic ports, is ice-free.

The line running eastward follows the valley of the Western Dvina to Latgalia, the most easterly point in the republic. The people of this region, the Latgalians, are related to the Letts but their language differs very considerably. Latgalia is more densely wooded than other parts of the republic and is economically less developed. Its biggest town is Daugavpils (Dvinsk) on the right bank of the Western Dvina.

LATVIAN S.S.R.

Territory: 25,000 sq. miles.

Population: 1,950,000 (estimated in 1940), majority Letts, second place held by Latgalians; many Russians.

Neighbors: North—Esthonia, east—R.S.F.S.R., south—Lithuania and Byelorussia.

Relief: Hilly plain with many depressions especially in valley of Western Dvina which is subject to floods.

Chief Rivers: Daugava (Western Dvina).

District of Russia: Main part since 1721 (actually a number of years earlier); Kurland since 1795.

Soviet Power established in 1940 (first established in 1918 but was not of long duration). Entered Union 1940.

Capital: Riga.

The northern line runs to Riga which is only twenty-five miles away. Riga is the biggest city in the three Baltic Republics. Before the war its population was 400,000. Riga possesses all the beauty and amenities of a modern city to which interest is added by the large number of medieval monuments. The city was founded in 1201.

The medieval buildings—houses whose upper storeys protrude over the narrow streets, Gothic churches and loopholed walls are concentrated mostly in Old Riga. This is the part of the city that suffered greatest damage at the hands of the Nazi

occupants, at the time of the battle for the liberation of Riga. "The House of the Knights of the Black Head," a fine medieval monument is one that was destroyed.

The new section of Riga is well planned. The architecture is the north-European type, steep tiled roofs and tiled walls. There are many trees, the streets are well paved and kept beautifully clean. The many faculties of Riga University occupy several blocks. Riga's industries are very important and include engineering, electrical goods, paper, food-processing, and the light industries.

The city of Riga is nearly ten miles from the sea. There is a local railway running to the harbor which was splendidly equipped but badly damaged by the occupants. Riga has played an important part in Russia's history. After the annexation of Riga in the eighteenth century, the port handled a large part of the export trade of the whole Empire. Its importance grew when railways were built connecting it with the rich grain-growing black earth regions. It was to some extent a rival to St. Petersburg and to some extent its complement. After Latvia separated from the Soviet Union in 1919, Riga's trade was confined to the exports of Latvia alone. The establishment of Soviet power by the Latvian people in 1940 and the inclusion of Latvia in the USSR gave its old importance back to Riga.

The splendid health resorts on the Riga littoral are famous throughout the USSR. The resinous smell of the pine woods mingles with the salt smell of the sea: underfoot there is soft golden sand, overhead the moderate sun of the north.

The Baltic landscape differs greatly from that of the Black Sea: in the south the deep waters are blue and are framed in the high mountains of the Caucasus and the Crimean ranges. The Baltic offshore waters are shallow, steel gray in color and the banks are low and covered with sand dunes (further north we shall see places where the sea has piled up hard crystal rocks—the skär of the Scandinavia fiords). The sky is pale, often overcast and definitely northern.

Leaving the gulf we continue our journey north over a picturesque hilly plain. There are few villages but many farms well built from rock and cement, situated about a kilometre apart. The steeples of the village churches are visible for a great distance over the plain and scanty woods. Most of the peat bogs have already been drained. Fodder crops are the most frequent for dairy-farming has been intensively developed in Latvia. There are also large fields of potatoes used as food for the pigs from which the excellent Latvian bacon is made.

VI. THE GULF OF FINLAND

THE frequent moraine ridges of the plain give the whole place a "stripy" look. Farmlands and peat bogs alternate and there are huge boulders in the fields. The soil is gravelly in many places and only forms a very thin layer over rock. There are woods on all sides. We have crossed the Esthonian border, but the difference is not marked: there are still few villages, numerous isolated farms and a number of small towns.

Esthonia is a maritime republic, more so, probably, than any other in the Soviet Union. The larger part of the republic is a peninsula between the Gulf of Finland and Riga, the smaller part consists of islands of which there are 818 in Esthonia (not counting the tiny islets); the main islands are Hiuma (Dago) and Saarema (Esel). The Esthonian coastline is about 1,210 miles long, excluding the smaller islands. Only the southeast corner of the republic is more than 60 miles from the sea. The majority of the republic's territory is within a couple of dozen miles of the sea. Of the three Baltic Republics Esthonia has the most markedly maritime climate. The winters are as mild as those of Riga or even Minsk which lies nearly 400 miles farther south. There is a big rainfall but the rains are irregular. This type of climate is eminently suitable for the cultivation of all kinds of grasses and fodder crops. The natural meadows provide

fine crops of hay. Dairy farming is the chief branch of agriculture.

Esthonian industries are quite well developed. The industries in Esthonia have had many ups and downs. Before Esthonia separated from the USSR in 1918 the towns of Esthonia, lying near the sea, were able to import cheap raw material and coal from abroad: for centuries there had been many skilled artisans in Esthonia and important engineering, shipbuilding, and textile industries worked for the Russian home market which at that time had far less industrial goods than it could absorb. When Esthonia became a separate bourgeois republic she lost the advantages which her favorable geographical position had given her. The Russian market was lost and the purchase of raw material and fuel abroad brought about an unfavorable trade balance. Latvia was in the same position and chose the road of de-industrialization: Latvia's economic profile as it developed during the period of bourgeois "independence" was characterized by a transition to the export of farm produce. Esthonia's former big, well-organized industries, degenerated to a modest textile industry, paper industry and a furniture industry.

Now that she has established Soviet power and joined the Soviet Union Esthonia has excellent economic perspectives. The huge internal market of Russia is again open to Esthonia and the removal of customs barriers in the east will provide her with a further source of raw material supply. A large part of Esthonian industry is concentrated in the capital, Tallin.

Tallin stands on the narrow entrance to the Gulf of Finland opposite Helsinki about fifty-five miles away.

The center, or heart of the city, is the "Vyshgorod" or "Hightown," an old citadel on a steep limestone hill. Outwardly Tallin is more modest than Riga although it bears some resemblance in its architecture—steep Gothic roofs, many tiles and narrow streets. Stone is used for building in place of brick. Esthonia in general is rich in building stone. There are important port

installations. From Vyshgorod the visitor has a clear view of the whole expanse of gray water which is the Baltic. The industries are on the outskirts of the city and in the numerous suburbs. The most important suburban districts are connected with the center of the city by electric railways.

ESTHONIAN S.S.R.

Territory: 18,200 square miles.

Population: 1,120,000 (estimate of 1939).

Neighbors: East—R.S.F.S.R., south—Latvian S.S.R.

Relief: Plain with moraine ridges. Highest point 703 feet (in south east).

Chief Rivers: Narva, Eimanga.

Produce: Combustible shales, timber, peat, fish.

District of Russia since 1710 (main part of country; some towns in eastern parts for long period before this date).

Soviet Power established 1940 (first established 1918 but not of long duration). Republic of USSR since 1940.

Capital: Tallin.

From Tallin we go east. All the way along the Gulf of Finland runs the Glint, the cliff-like edge of a limestone plateau, which is covered only by a shallow deposit of soil near the sea. The Glint does not form the seacoast but is at times often as far inland as six miles from the coast. The coastline is very much indented and there are many tiny islets that seem to have fallen into the sea; these serve as a reminder that the Finnish coast opposite is sprinkled with thousands of these islets, the Swedish skär.

To our right as we travel east lies the ancient Esthonian town of Tartu, the Russian Yuriev, the most important cultural center of Esthonia. The town was founded in the eleventh century. The Germans ruled Esthonia for many centuries and they changed the Russian name of Yuriev and the Esthonian Tartu

to Derpt or Dorpat. The central feature of this cosy little town is its old university.

In the strip of land that lies between the sea and the big Lake Peipus (Chudskoye Ozero), there are many outcrops of shale which provide modern Esthonia with her fuel supplies.

Lake Peipus has historical memories for the Russians as well as for the peoples of the Baltic republics. The Ests, like the Letts, Latgalians, and Lithuanians constantly fought against the robber barons and pirates from the west who had subdued their countries. These Baltic peoples, therefore, were the natural allies of the Russians.

The ancient lands of Novgorod lay at the southern end of the Gulf of Finland and formed the historical littoral of Russia. When the German barons had conquered the peoples of the Baltic they attempted to dislodge the Russians from the sea-coast and weaken them. In 1242 the Russians headed by Alexander Nevsky defeated the German knights in a great battle on the ice of Lake Peipus and by defending this corner of Russia they checked German aggression in the east.

After this the struggle of the Baltic peoples for their independence and of the Russians for the maintenance of their outlet to the sea never ceased.

Narva stands on the border between the R.S.F.S.R. and Esthonia on both banks of a river of the same name. It is but a few miles to the sea from the city and the old-fashioned vessels with their shallow draught were able to sail right up to Narva. Narva is a very old town, the contemporary of Tallin. Narva also has its Vyshgorod or citadel that has been destroyed and rebuilt time and again and which today is still very picturesque. For the last century cotton fabrics and heavy cloth have been the town's principal means of subsistence. The huge weaving sheds stretch for hundreds of yards along the river bank, towering above the small houses of the town. There was a decline in the textile industry after Esthonia separated from Russia but

the reunion again made it possible to use the mills to full capacity. The war prevented the realization of new plans for the Germans razed all the Narva mills to the ground. They are today under repair and some of the weaving sheds are already working.

VII. LENINGRAD

LENINGRAD is the second metropolis of the Soviet Union (population in 1939—3,200,000). When Peter the Great founded the town in 1703, and transferred the capital there in 1713, he named it Saint Petersburg or, as they called it in those days in “the Dutch manner”—Pieterburkh. In 1914, after the outbreak of the First World War the name of Petersburg which had too much of a German sound about it was changed to Petrograd. The present name of the city—Leningrad, the city of Lenin—was given to it after his death in 1924. The great patriotic sorrow of the Russian people who had lost their great revolutionary leader was expressed in the renaming of the famous city which gave birth to and saw the first victories of the October Revolution of 1917. Before the Revolution Lenin had carried on very considerable revolutionary activity in “Pieter” as the Leningrad workers called their city.

Lenin was the favorite of the Petersburg workers, the most progressive and class-conscious section of the Russian proletariat.

Leningrad is not only the Soviet Union's second city, rivaling Moscow economically and culturally, it is also a whole epoch in Russian history materialized in buildings and streets; it is reflected in tradition and custom and in all forms of art. The whole of the eighteenth and nineteenth centuries in Russian history are often called the “St. Petersburg period.” The poet Pushkin's famous line which said that when Peter the Great built St. Petersburg, “he opened a window looking into Europe” is an epithet that has remained for all time.

Even today we are astounded at the scope of Peter's plans;

a face of countless difficulties he built in an uninhabited swampy region a capital city for a world power, built in an incredibly short time and in such a way that it was a credit to the country and a beautiful "front entrance." The names of Rasrelli, Leblanc, Tresini, Felten, Quarengi, and Rossi are immortalized in the wonderful buildings of the city for Peter and his successors, wishing to build a capital that was really European, invited the best of the Western architects to that desolate swamp. As the school of Russian architects grew up, new buildings and embankments were added by Voronikhin, Bazhenov, Stasov, Starov, Takharov, and others.

LENINGRAD

(formerly St. Petersburg—Petrograd).

Founded—1703, Official capital of Russia from 1713–1918.

Population—3,191,300 (1939).

Situation—on both banks of the Neva at its mouth; occupies 101 islands. 59°57' N. Lat. 30°19' E. Long.

Average Temperature—January 7.6 below zero C. July 17.5°, Annual rainfall—21".

Distance from Moscow—405 miles by rail.

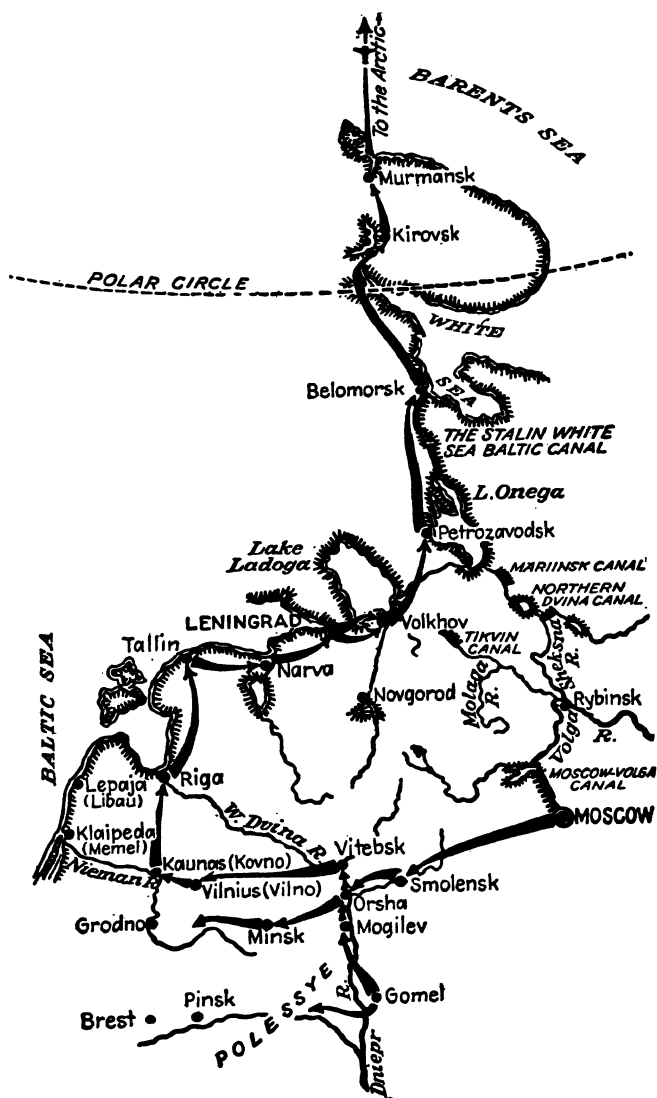
Economy—industrial (machines, especially precision machines, shipbuilding, electrical goods, textiles, mostly cotton, chemicals, rubber) prewar (1938) Leningrad provided 12.3 per cent of country's industrial output; important seaport with waterways to interior of country; important center for training industrial specialists.

Education, etc.—Over 50 higher educational establishments including the famous University, the Polytechnical Institute, the Academy of Arts, the Academy of War Medicine; some 150 scientific research institutes, numerous museums (including the world-famous Hermitage and the Russian Museum), the Public Library (second biggest book repository in the USSR), the Academy Library, several dozen theaters the best known of which are the Opera House, Comedy Theater, Maly and Pushkin Theaters and the Philharmonic.

When St. Petersburg became the capital of the Empire it also became and for over 200 years remained the center of Russia's spiritual culture. Alongside the imperial palaces, the ministries and the mansions of the aristocracy, the Academy of Sciences was built up, and the Academy of Arts was founded and periodicals were published there. Literature and arts which were deep-rooted in the old Russian culture now grew richer from contact with the West; St. Petersburg was for many years the seat of the arts. All the great Russian names in the arts and letters of the eighteenth and nineteenth centuries are in one way or another connected with St. Petersburg. Derzhavin, Zhukovsky, Pushkin, Gogol, Lermontov, Nekrassov, and Dostoyevsky lived and produced their works in St. Petersburg; in the St. Petersburg Academy of Sciences Lomonosov, Mendeleev, and Pavlov worked; the Russian Geographical Society, founded there over a hundred years ago, had such names as Semenov-Tian-Shansky, Przewalski, and Veikov on its rolls; the great Russian painters, Brullov, Ivanov, and Repin passed through its Academy of Arts; famous Petersburg musicians were Glinka, Tchaikovsky, and Rimsky-Korsakov (Shostakovich today); the world-famous Russian ballet was built up in St. Petersburg and the leading Russian theaters were developed there, both opera and drama, which had such famous names as Varlamov, Davydov, Komissarzhevskaya, Chaliapin and Sobinov on their casting rolls.

St. Petersburg became the center-point of all Russian culture and as the social basis of the intelligentsia was broadened, the number of radical-democratic elements increased.

Russian revolutionary conceptions took form in St. Petersburg, in the immediate neighborhood of the secret police, the notorious "Third Department" and the Russian gendarmerie. The city became the arena of the struggle against tsarism; there were great thinkers like Belinsky and Chernyshevsky, there were big revolutionary circles whose success varied in accordance with their contact with the masses of the people, in accordance with



the extent to which they represented the interests and hopes of the people. The first Soviet of Workers' Deputies in Russia was set up here in 1905. In St. Petersburg *Pravda* was published alongside the monarchist newspapers and it was here, in 1917, that the monarchy was overthrown by the action of the masses. A few months later the Soviet system gained the upper hand in the city. Such, in brief, is the history of this one city.

Naturally we did not take the shortest route to Leningrad when we passed through Byelorussia and the Baltic republics. It is reputed that when Tsar Nicholas I was asked to select the route for Russia's first railway he picked up a ruler and in silence drew a straight line from Moscow to St. Petersburg. The Russian main-line railway built between 1848 and 1851 was in an almost perfectly straight line. On this line the passenger feels this physically, there are no turns, no jolts and the train runs with perfect smoothness. The Moscow-Leningrad line is the most comfortable and convenient in the Soviet Union. All the fast and express trains make the journey during the night so that the day of arrival and departure are left free. Trains leave Moscow and Leningrad at exactly the same time and meet half way at Bologoye in the middle of the night. At this time the passengers are fast asleep in their coupés as comfortably as in a hotel. In the morning the passenger gets out of the train at a station that is exactly the same as the one he entered overnight only he is no longer in, say, Moscow, but Leningrad.

Straight as an arrow from the square in front of the Moscow Station in Leningrad runs the Nevsky Prospect right down to the river. Our first steps along this famous street show us one of the distinguishing features of Leningrad architecture; the buildings are designed in groups or ensembles. There is no mixture of small houses and skyscrapers on the Nevsky prospect—the buildings form one long and beautiful line with an average of five storeys.

Nevsky Prospect is always a busy street. The Leningraders love their main streets and always try to combine business with

a walk along Nevsky. As we walk along we see big bookshops, restaurants, cafés, theaters, cinemas, and concert halls. There are always many young people about while the traffic on the wide asphalt road that has now replaced the only wood-block paving in Russia is always heavy.

A few blocks from the station Nevsky Prospect crosses the River Fontanka. The banks of the river are lined with clipped trees. The bridge is decorated with four fine sculptures at the corner-posts representing a youth taming a horse. On our left after we cross the bridge is the Young Pioneers' palace, once the Anichkov Palace and residence of Tsar Alexander III. Today the boys and girls of Leningrad study music and drawing, attend amateur dramatic, literary, and technical circles, give performances and evening concerts of their own, see the latest films and meet famous people from all over the country in the Pioneers' Palace. The Fontanka is one of the streams into which the Neva splits as it forms a delta at its mouth. As we proceed along Nevsky Prospect we shall cross two more of them—the Griboyedov Canal and the Moika. The streams of the Neva delta run between granite embankments and are crossed by excellent bridges. The abundance of water, the embankments with their lacework grills, the serene façades of the houses, the ornamental plants have earned for Leningrad the name of the Northern Venice.

To our left after we have passed the Fontanka is the huge square, laid out in Empire style, in front of the Pushkin (former Alexandrinsky) Theater. Beyond this is the building of the Leningrad Public Library, the oldest book repository in Russia and one of the biggest in the world.

But a step farther and we are face to face with ghastly traces of the war; we see the burnt-out ruins of the old Merchant House where there were formerly shops under the arches of the covered galleries. This damage was done during the fiercest German air-raids in the winter of 1941-42. As we pass along the Nevsky Prospect we see many newly repaired buildings, empty

spaces where ruins have been cleared away while in some places there are still the signs "During artillery fire this side of the street is dangerous." On busy Nevsky Prospect today it is difficult to imagine the horrors experienced in heroic Leningrad during the 900 days of the siege, when there was a terrible famine, constant air-raids and a regular methodical artillery bombardment; in that ghastly winter there was no fuel, water, or light and the millions of people in Leningrad lived through what no major city in the world has ever experienced before. The siege of Paris in 1870-71 lasted one winter, that of Leningrad lasted three. The people felt the hunger all the more because there was nowhere they could get warm—they froze to death gradually because they were so terribly, monstrously hungry. Shadows tottering from weakness had to wait hours in some cold yard until the gunfire ceased and then spend their last ounce of strength in sleepless nights caused by air raids. On many jackets we see the bright green ribbon of the "Defence of Leningrad" Medal worn by those who lived through the siege, for those who were in the city not only had to withstand all the horrors of cold and starvation but they had to work as well. Work in the factories never ceased, they were all on a war footing and were supplying the front which was a few miles from the southwestern corner of the city: the Leningraders said in those days, "You can go to the front by tram."

This section of the front, completely cut off by the siege, could only supply arms or ammunition from the interior of the country by super-human labor. Factory buildings were turned into dumps for the storage of shells to feed the guns at the front. In addition to this the water mains had to be repaired in order to supply water at least to the hospitals; the streets had to be cleared of snow and wreckage so that occasional trucks loaded with shells and precious food could pass along them to the front; the people had to forget the gaping holes in their walls where the bombs had blown out the windows, they had to

stand watch on the roofs and extinguish incendiaries, they had to cut the wooden parts of the bombed houses for firewood, they had to bury their dead, carry water which they scooped up through holes in the river ice, build fortifications in case the enemy broke into the city—Leningrad did not consider giving up the struggle. Even today there are still shop and house windows bricked up with narrow loopholes for machine guns aimed down those streets that the enemy might use on entering the city. Just try to imagine what it meant in Leningrad merely keeping alive and retaining the will to resist! This is what the green “Defence of Leningrad” Medal ribbon means that we see on the breasts of so many Leningraders today.

VIII. ON THE BANKS OF THE NEVA

THE Nevsky Prospect leads us to the compositional center of the city, the Admiralty, whose spire, visible all the way from the station, puts the final touch on the Prospect. Three main streets meet at the thin gilded spire and these form the skeleton of the city’s planning. The area around the Admiralty is built up with splendid groups of buildings. To the right there is the extensive semi-circular place before the Winter Palace and the Hermitage. The rich baroque façade of the Winter Palace, built by Rastrelli, on one side of the Place is complemented by the severe lines of the classic façade on the opposite arm of the semicircle. The center of the semicircle is divided by an arch on which stands a splendid statuary group of a six-horsed triumphal chariot driven by two Roman soldiers. In the geometric center of the Place is a 165-foot column of polished granite surmounted by a bronze angel. This column was erected to celebrate the victory over Napoleon. The column is a single piece of stone and in the whole world there are few monoliths of this size.

The Hermitage is a museum of world-wide importance: it

contains an excellent collection of West-European painting and sculpture and some fine examples of classical, Egyptian, and Scythian antiquities.

The severe classical-style buildings of Leningrad are mostly painted yellow and white—the dark-yellow surface of the walls are framed with white columns, white is used to emphasize the plaster modeling of the window and door frames. This characteristic coloring is also employed on the majestic Admiralty building in the center of which is a dome surmounted by a tall, narrow steeple. The top of this needle-like spire is crowned with the gilded model of an old sailing ship. The Admiralty was built by the Russian architect Zakharov.

To the left of the Admiralty there are two open squares and the visitor does not know which to give his attention to. The huge mass of St. Isaac Cathedral with its heavy columns and gilded dome (the cross on the dome, 330 feet high, is the highest point in flat Leningrad), the florid equestrian statue of Nicholas I and the stately Marinsky Palace fill the first of them; the second square contains the empire-style façades of the former buildings of the Senate and the Synod which form a connected group with the left wing of the Admiralty. In the center of the square, against the background of the Admiralty Gardens and the huge dome of St. Isaac's is the famous equestrian statue of Peter the Great, Pushkin's "Bronze Horseman." This is Falconet's greatest sculpture—the horse is rearing on the brink of a huge granite block and the majestic horseman with outstretched hand is at the same time urging the horse on and restraining it.

The Senate Square is open to the river. A few steps farther and we pass the Admiralty Building and reach the granite-lined banks of the Neva, Leningrad's finest ornament. It would be impossible to conceive of Leningrad without the Neva. The basins drained by Lake Ladoga and Lake Onega pour all their overflow into the short, deep Neva (it is only about fifty miles long); the water flows almost level with the banks. The two

lakes from which it takes its source are natural filter beds which makes the Neva water clean and almost free of mineral substances; they also serve to regulate the flow of water so that spring floods are rare in Leningrad. It frequently happens, however, that sea winds, especially in the autumn, blow huge masses of water from the funnel-shaped Gulf of Finland into the mouth of the Neva. Despite the fact that the low-lying swampy territory around Leningrad has been raised and built up for over two hundred years and immense protective embankments of granite have been built, the sea water driven by the winds are still a menace to the city. The flood of 1824 was a terrible calamity which Pushkin described with poetic grandeur in his "Bronze Horseman," in 1924, exactly a hundred years later there was another such catastrophic flood. There are many buildings in Leningrad which bear a tablet showing the level reached by the water in that record year. There are minor floods every few years from the same cause.

The color of the Neva changes with the season, weather, and the lighting, at times it is blue, at others, leaden gray, while sometimes it sparkles mysteriously in the mist. The façades of the buildings, the steeples, and embankments seem to change with the color of the water. The view on the Neva is at its best on a summer afternoon, when the northern sky has a soft greenish hue with the first tinge of sundown. In the clear transparent air over the water distant things seem nearer, the landscape has depth, plasticity, the tones are not bright but the picture is drawn with the clearness of an etching.

Opposite us on Vasiliev island which is formed by the two main streams of the Neva, is a long row of stately buildings housing the University, the Academy of Arts (before which stand two sphinxes brought from Egypt), the Mining Institute. Further still to the left, right down by the seacoast we can see the silhouettes of giant cranes, chimneys, and the stocks of the shipyards which lie between us and the port of Leningrad.

As we go upstream we pass a fine bridge between the Ad-

miralty and the tip of Vasiliev island (at night the two leaves which form the center span of the bridge open up like the Tower Bridge in London to allow shipping to pass up the river), past the Winter Palace which has a second façade looking out on to the river, past a number of mansions and small palaces and the beautiful Marble Palace to the Summer Garden with its huge, century-old oaks and its ancient sculptures. Peter the Great's Summer Palace is in the Summer Garden; on these same paths where children now play, Peter once gathered the recalcitrant Russian Boyars and making them mingle with foreign gentlemen and the captains of Dutch vessels compelled them to learn European society manners.

Opposite the Summer Garden is an extensive green lawn. This was formerly known as the Field of Mars and in the center was a monumental tomb to the victims of the 1917 Revolution. The Field of Mars is one of the most beautiful city squares in Europe; it is surrounded by the magnificent Empire building of the former barracks, the Marble Palace, and the Mikhailov Castle.

Between the Marble Palace and the Summer Garden the graceful arch of the Kirov Bridge crosses the Neva—the biggest and most magnificent of the six city bridges across the Neva. The Neva is almost a mile wide at this point. From the center of the bridge we can get a splendid view of the city of Leningrad.

We see below us that the Neva splits into three main streams forming a number of islands—pieces of the city—each of which is crossed by a number of minor streams. It is no wonder that in Leningrad there are almost five hundred bridges.

Directly ahead of us is the tip of Vasiliev Island with the façade of the old Bourse and two triumphal columns. Farther to the right, beyond the Lesser Neva is that part of the city which is known as the "Petrograd Side," a district consisting of a number of small islands. The more distant islands, Yelagin, Kamenny (Stony) and Krestovsky (Cross) form the city park

district where there are sports grounds and anchorage for yachts. The long tip of one of these islands is a favorite promenade at sundown. From the Kirov Bridge on which we are standing runs the Kirov Prospect, leading directly to the Island: it is lined with magnificent buildings beginning with the massive but delicate granite mosque built at the beginning of the twentieth century when royal Petersburg made an effort to acquire all the brilliance of a world capital, where representatives of the distant and exotic lands and religions under the rule at the Empire would stand at the throne; at the same time, a Buddhist temple, picturesquely hidden in greenery was also built.

Close at hand, right beside the Kirov Bridge stands the granite mass of the Fortress of SS. Peter and Paul which seems to serve as a pedestal for the lacework contours of the baroque cathedral with the tall spire of its belfry stretching up into the sky. This is the oldest part of Leningrad for the building of the city began with the fortress which was then a structure of earth. The batteries mounted on the fortress were intended to defend the mouth of the Neva, that had been newly won from the Swedes. The defences of the river-mouth moved far to the west even in Peter's time; the fortress of Kronstadt was built, Leningrad's most reliable bastion on the island of Kotlin at the entrance to the Gulf of Finland. The Fortress of SS. Peter and Paul has remained as a monument to the first years of St. Petersburg. The Cathedral became the burial place of the Russian tsars and the casemates of the fortress were turned into prison cells for the most important state prisoners. Many rebellious aristocrats and hundreds of revolutionaries and free-thinkers have spent long years of confinement in the fortress.

Behind us there is a long line of florid palaces, private houses and former embassies which stretch from the Admiralty and the Winter Palace to the Summer Gardens. Behind this line of buildings rises the colored dome of the Church of the Saviour, a building in imitation ancient Russian style that was built on

the spot where the terrorists of the People's Will Party assassinated Alexander II in 1881. At every step we come across traces of the long stubborn struggle between revolutionary Russia and tsarism—Senate Square, where in 1825, the artillery that remained loyal to the regime mowed down the columns of Decembrist insurrectionists, the most liberal section of the nobility; the casements of the Fortress of SS. Peter and Paul that appears have been built symbolically on the right bank of the river opposite the Winter Palace, the tsar's residence; the bridges over which police and troops, on the orders of Nicholas II drove and shot down the demonstrating workers in 1905, the graves of the victims of the revolution on the Field of Mars . . .

Above the Kirov Bridge the Neva makes a sharp turn; at the bend is one of Rastrelli's chefs d'oeuvre—the Smolny Cathedral and beside it the long classical-style building of the Smolny Institute which in the autumn of 1917 became the headquarters of the Revolution whence Lenin and Stalin led the battles that brought victory to Soviet power first in Petrograd and then throughout the whole of Russia.

Our excursion that time is a long one for in a Leningrad summer one does not notice when night falls, except by the clock. Newcomers on their first day in Leningrad are often astonished to learn that it is already long past midnight when they thought it was no more than nine-thirty or ten. These "white nights" give the Leningrad summers a peculiar beauty of their own. The twilight merges into dawn when the whole northern horizon is a mass of color—pale pink, pale yellow, and pale green, all of which merge into each other. All the colors are pale, pastel tones that are pleasant to the eyes. The few stars that dare show themselves on these bright nights are all concentrated on the southern horizon where there is faint darkness in the city. At the time of the summer solstice (June 22nd) it seems that the sun dips behind the horizon for only a few minutes although actually it is out of sight for five and a half hours;

the sun is so high, however, that even during this period of twilight it is almost like day. At all times of the day or night it is possible to read in the open almost without an effort. Leningrad, despite its temperate climate, is a northern city—it is on the same parallel as the southern tip of Greenland and Alaska.

The splendid buildings of Leningrad have an especially magnificent and majestic appearance in the transparent air. In the mysterious hazy light that hangs over the smooth surface of the Neva the spires of the Admiralty and the Fortress of SS. Peter and Paul flash golden. On the white nights one does not feel the desire to sleep, one wants to wander through the streets; the white nights were made for writers of romances and a good half of those written in Leningrad owe their origin to them.

The splendid summer, however, has to be paid for in winter when the bleak days are almost as short as the summer nights. In December it does not get light until ten and at three o'clock it is already dark again; in addition December is usually rainy. The temperature is not very low on account of the presence of the sea and the snow does not settle to improve the lighting until after the new year when the days also begin to grow longer.

IX. INDUSTRIAL LENINGRAD

If we stand on the Kirov Bridge on a clear summer evening we can see all around the horizon a circle of tall chimneys—the visual evidence of the belt of industrial concerns that encircles Leningrad. The city is not only a sort of art museum of beautiful palaces, gardens, and embankments, of monuments and works of art that are gathered to enhance the glory of Imperial Russia, but have now been placed at the disposal of the people, it is more than this, it is an important industrial center. Before the Second World War the value of Leningrad's industrial output was about one-eighth of the total of the USSR, slightly less than that of Moscow. Before the Revolution Lenin-

grad was Russia's biggest industrial city and her most progressive from the technical standpoint. During the period covered by the Five-Year Plans the plants of Leningrad learned to turn out the most complicated machines for the industrialization of the country; the Leningrad engineers were then able to organize other factories in all parts of the country for the serial production of the machines they themselves had started making. The first Soviet-built tractor, for example, came from Leningrad. Light industrial goods bearing the marks of Leningrad factories,—boots, knitted goods, clothing, and cigarettes—are still considered the best in the country. This high standard is naturally connected with the high cultural level of the people of Leningrad.

The big Leningrad plants such as the Kirov, Electrosila, Baltic, Stalin Metal Works, and others turn out everything from battleships to delicate instruments and apparatus; the textile industry consists of dozens of very large mills, most of them working in cotton goods; the famous "Red Trinagle" plant is the biggest rubber works in Europe. A mere list of the big industrial concerns of Leningrad would occupy many pages of this book. Even before the Revolution the city was famous for its large-scale industry. These industrial forts form a ring around the whole city and it was the workers in them who, in 1917, took power into their own hands and changed the whole course of Russian history. The ring of factories grows especially deep on the southern edges of the town where a bunch of main line railways all converge (from Moscow, the Ukraine, Novgorod, the Baltic, and Byelorussia); this is the place where the huge port of Leningrad joins the city. The landscape is that of a typical industrial region: the long fences of stores and warehouses, numerous intersecting railway lines, the huge blocks of the factory buildings, a web of overhead wires around the car barns, and a forest of chimneys sticking up into the sky.

We shall take a car from the center of the city and ride down the new highway that cuts right through the factory belt. This part of the city shows us much of the new Leningrad that is

replacing the old factory fences and the tumbledown houses in which the workers lived on the outskirts of the city. The wide asphalt road itself is pleasant to look upon. The Red Line, as the street is called, is lined with new apartment houses, clubs, schools, and other institutions. On both sides of the road there are well kept lawns separated from the side-walks by hedges. The new buildings have been richly treated architecturally and the huge amount of glass used is a noteworthy feature. The rebuilt and newly planned factory buildings do not offend the eye—there is less smoke and the grime of the old boiler houses has been replaced by a network of electric wires coming from the sub-stations. There are large department stores and numerous fine gardens throughout this part of Leningrad.

The wide ribbon of the Red Line soon becomes the Moscow Highway. The industrial regions of southern Leningrad are moving southward at a rapid rate. The Highway is being built up with the same type of large apartment houses that we saw at the other end of the road in Moscow, where it is called the Leningrad Highway. On our left we pass the new meat packing concern, one of the most up-to-date of its kind in existence.

The Moscow Highway takes us to Pulkovo where we again run into traces of the war. The Germans were at Pulkovo and batteries stationed here fired their shells into the city. As we walked through Leningrad we saw many houses that had been "wounded" by shells from German guns and by aerial bombs; we also saw ruins that were hidden behind newly built fences or had been replaced by hastily laid-out gardens. As we travel along the Moscow Highway, however, there are still greater numbers of these monuments to barbarity—the enemy did his worst in this part of Leningrad.

X. THE RUSSIAN VERSAILLES--

PULKOVO HILL overlooks a low, flat plain that forms the southern side of Leningrad. Before the war the famous Pulkovo Observatory, the most important in the USSR, stood on this

hill in a densely wooded park. The Germans destroyed the observatory quite unnecessarily; in the terrific fight that took place for the possession of Pulkovo Hill the ancient park was ruined and the earth torn up.

The town of Pushkin is not very far from Pulkovo. This town was once called Tsarskoye Selo; the summer residence of the Russian emperors took the form of a number of luxurious palaces forming a fine ensemble in a group of wonderful parks. In this place everything that architecture and landscape gardening could do to satisfy the refined tastes of the eighteenth century and the comfort and elegance of the nineteenth century was gathered together. The huge Catherine Palace in baroque style, with its hundreds of rooms and halls containing the only collection of old furniture and knickknacks of its kind, with its beautiful palace chapel and the famous "Cameron Gallery" ornamented with sculpture; the severe but majestic Alexander Palace; pavilions hidden away in unexpected corners of the parks for intimate palace suppers, for out-door spectacles and celebrations: grotto, a whole "Chinese village" with whimsical bridges thrown across the canals and fantastic summer-houses; a toy navy on a huge lake where there was a collection of ships and rigging of all nations and all times—such was the extent and variety of this Russian Versailles. After the Revolution the whole of Tsarskoye Selo was turned into a huge museum and served the Leningraders as a week-end holiday resort and as an exhibition illustrating palace life in tsarist Russia. In the same district there was the old *lycée* where Pushkin spent his boyhood years; it is, therefore, a cherished monument of Russian culture. A sculptured group representing a schoolboy sitting thoughtfully at his desk was erected in front of the *lycée*. After the Revolution Tsarskoye Selo, where a quite large town grew up outside the bounds of the royal parks, was renamed in honor of the great Russian poet.

The Hitlerites occupied Pushkin for over two years and did very considerable damage to the museum-town. The palaces were

plundered, partially burnt, and partially blown up; the trees in the parks were felled by the vandals. The Hitlerites tried to remove everything valuable to Germany. The historic relics dear to the hearts of the Russian people, the treasures that had been created by centuries of toil on the part of serf-artists and by the best "overseas" builders Rastrelli, Quarengi, Cameron, have either perished completely or are in such a state that their restoration will require many years of arduous labor.

The same fate overtook other suburban parts of Leningrad, the former imperial residences that after the Revolution became museum parks:—Peterhof with its wonderful fountains and ornamental parks which rivaled Versailles, the somewhat gloomy Gatchina, and the airy and joyful Pavlovsk built in a huge English park.

Now we must leave Leningrad and its environs, that treasure-house of monuments to Russian history and works of Russian art. We are sorry to leave a city where even the granite seems transparent on the "white nights," where countless historical and cultural associations are awakened, a city that is in itself a monument to its heroic defence.

XI. THE ROAD OF LIFE

A SMALL river steamer takes us to Lake Ladoga across which we shall continue our journey to the north. Leaving Leningrad and sailing up the Neva we pass the Smolny Institute, and a long string of warehouses and factories that are here built on both sides of the river; at first the factories form a solid phalanx on both sides, then they begin to thin out and there are vacant lots between them. The well-built new embankment that runs along the right bank for several miles on a part of the river where there are practically no buildings shows us part of the plan for the further development of the city. At the new Volodarsky Bridge, which has towers at each end and two leaves that open up in the middle, the city of Leningrad really ends.

We pass suburban villages, the gently sloping banks are dotted with groves of leafy trees interspersed with truck gardens; here and there are groups of summer cottages. The nearness of a big city is still felt; occasionally big factories appear in the otherwise rural landscape; there are power stations, brickfields, and suburban state farms. Everywhere we see ruins, for this was the scene of heavy fighting, the place where success in the struggle meant the lifting of the siege for the Russians or its intensification for the Germans; a change of even a few hundred yards in the front line meant that the ring around Leningrad was either growing smaller or was being weakened according to which side made the advance.

The last in the chain of Leningrad suburbs which lie along the whole Neva is Schlusselfburg, now known as Petrokrepost, an old Russian fortress at the very source of the river. After the wars which Peter the Great fought for the possession of the Neva, the fortress lost its military significance and like the fortress of Peter and Paul served as one of the most terrible prisons in Imperial Russia. Many Russian revolutionaries spent dozens of years of their lives within the walls of the fortress—Nikolai Morozov, Vera Figner, and others. We are astonished today at the courage shown by these lonely fighters who in those distant times (the eighties of the last century) threw down a proud challenge to tsarism, at that time the seemingly unshakeable bulwark of European reaction. Many of the old revolutionaries (members of the "People's Will Party") were executed, others were imprisoned in the gloomy cells of Schlusselfburg; those who lived to see the victory of the Revolution in Russia were afterward the object of all honor. The little town around the fortress has become an industrial suburb of Leningrad; the industries are chiefly textile, especially important are the dye works for which the crystal clear waters of Lake Ladoga are very important.

The fight for Schlusselfburg, traces of which are to be seen at every step in the ruins, the shell and bomb craters and the

torn-up earth, was an important stage in breaking through the ring around Leningrad.

The huge lake with its shores disappearing into the distance opens up before our eyes from the very fortress. Lake Ladoga, the last stage of our journey, is memorable for the part it played during the siege of Leningrad. As the ring closed in the only outlet from the city was across the waters of the lake. The people of the city had to clench their teeth and tighten their belts and wait until the winter frosts made the ice sturdy enough to build a road strong enough for heavy motor trucks. This road became Leningrad's lifeline. Despite the fact that the ice road was very close to the front and that the *Luftwaffe* shattered the ice with high-explosive bombs, a constant stream of trucks kept moving across the lake throughout the winter. In one direction they carried boxes of shells for the defence of the city, barrels of gasoline, sacks of flour, meat, tinned food, and other valuable provisions which were distributed in minute quantities to maintain life in those who remained behind in the city; in the other direction the trucks carried the wounded and sick, women and children who had not been able to leave the city before the ring closed in, and who were now mustering the last ounce of their strength to ride down the "road of life" which was for many but a road of death. The organization of the working of the ice road closely approached perfection. Holes made by bombs were immediately marked by flags and a track marked out around them. A constant battle was fought for air supremacy over the road; the battle ended in victory for the Soviet airmen who thus ensured the comparative safety of the road. Traffic regulation officers, soldiers in their gray Russian coats, were there in all weathers to point out the way to the truck drivers. Day and night, in terrific frosts and blizzards the two streams of traffic continued like that on any busy city street. The trucks were trying to do what the trains of seven big main-line railways had done before the war. Naturally even a constant stream of trucks could not hope to give Leningrad more than a fraction of what the railways

had previously supplied, but what they did bring saved the city.

Lake Ladoga is the beginning of all those artificial waterways which connect the Baltic with the interior of the country. The Svir River runs into Lake Onega whence the Baltic-White Sea Canal takes us to the White Sea; the Mariinsk System (the Vitegra River, the Mariinsk Canal, the Kovzha River, Lake Beloye and the Sheksna River) takes us to the Volga. In order that the river barges using the Mariinsk system should not suffer by the storms on Lakes Ladoga and Onega (these are the biggest Lakes in Europe: Lake Ladoga is about 7,000 square miles in area), by-pass canals have been cut along the southern shores of both lakes. There are two other old canals which lead straight from Lake Ladoga to the Volga, the Vyshnevolotsky and the Tikhvin systems, although today these are of little importance. The former system begins with the swift flowing Volkhov with all its rapids which flows into Lake Ladoga; near the mouth of this river the first big hydroelectric power station in Russia was built in 1926. The second system follows the rivers Syas and Tikhvin; near the old Russian town of Tikhvin with its ancient monastery, the birthplace of Rimsky-Korsakov, rich deposits of bauxite, raw material for the manufacture of aluminum, have been discovered. The nearness of these bauxite deposits to a source of cheap electrical power solved the first problem in the production of Soviet aluminum. In picturesque forested regions, between hills with reddish-colored, cliff-like sides that are typical of bauxite country, the Tikhvin Bauxite Mining Combine has been built; a new town Bauxitogorsk has grown up around the mines. The second link in the production of the aluminum, a plant for the extraction of the metal from the alumina by electrolysis, has grown up near the Volkhov Power Station. New industries have sprung up on the ancient Russian waterways forming the town of Volkhov.

Volkhov is also an important railway center. A line runs westward to Leningrad, a distance of about seventy miles. To the east the line goes through Vologda and Kirov to the Urals and

links up with the Trans-Siberian Railway. A line to the north runs through the Karelian-Finnish Republic to Murmansk.

We take the train at Volkhov and from the windows may look back at the town where there are still many buildings badly battered by shells and bombs. The town was quite near the front and suffered in consequence. Volkhov, however, was on what the Leningraders called the "Mainland"—the whole of the USSR beyond the siege lines. In the Mainland there was food, there was a huge country in the interior of which it was possible to hide the sick and the children from bombs and shells; on the Mainland they could begin the work of driving the Germans out of our country, while Leningrad could only manage to defend itself. Salvation would have to come from the Mainland, and from the Mainland it came. The name of Mainland is an old Russian colloquialism used by those who winter in the Arctic and who meant the place where they had left their families, the place from which they obtained everything they needed, the homes they thought of with fondness when going about their difficult and dangerous business.

From the window of the train we see the fine lines of the dam belonging to the power station: The Germans bombed this station on many occasions, but never succeeded in scoring a direct hit so that the station supplied current to Leningrad throughout the siege by a cable that was laid with great difficulty on the bed of Lake Ladoga. We stop for a minute at a tiny platform which bears the ostentatious name of Murmansk Gates and then the train turns sharply to the north.

XII. THE LAND OF LAKES AND FORESTS

Soon after the train crosses the Svir River it enters the Karelian-Finnish Republic. The subsoil of the whole republic consists of primitive crystal rock. All over the country there are traces of the action of glaciers. The surface was made slightly undulating and the creases smoothed out by the ice while one frequently

sees big boulders left in the middle of fields. The nature of the relief makes Karelia a country rich in lakes: many of them have their long axis running from northwest to the southeast. The rivers are full of rapids and contain a large volume of water as a result of the rather damp climate; they are therefore eminently suitable for the working of power stations. There is little evaporation of water in the country which leads to the formation of extensive swamps. Two-thirds of the republic are covered in forests, mostly pine and fir; important minerals are iron and building stone. There is a large amount of peat and the rivers and lakes are rich in fish.

The chief farming district is in the southern part of the republic; animal husbandry and vegetable growing are the most important branches of farming. Lately larger areas are being sown to fodder crops and wheat in addition to the former vegetables, rye and barley; in the last year before the war the crops planted amounted to ten times those planted before the Revolution. Farming is gradually spreading northward as far as the Arctic circle.

The fields are usually surrounded by a fence of thin poles thrust into the ground at an angle with the perpendicular. On all sides we see large wooden frames resembling ladders that are used to dry out the sheaves after harvesting. The cottages are tall and have two storeys. The upper storeys of these houses is the farmyard and the horses pull carts up a sloping ramp straight into them.

The window-frames of the houses are decorated with beautiful intricate wood carvings. If we look out of the windows to the right of the train there is a long steel-colored line which has a background of wooded hills just showing on the horizon. This is Lake Onega, on the western bank of which stands Petrozavodsk, capital of the Karelian-Finnish Republic.

During the period of the Five-Year Plans many fine buildings were erected in the town. The German-Finnish occupation of 1941-1944 wrought very considerable damage to the city. The

most valuable buildings in the center of the city were completely destroyed. Extensive work was necessary to get the industries going again; the chief industries of Petrozavodsk are working today, but there is still much repair work to be done. In Petrozavodsk there is the Onega Metal Works (*Zavod* in Russian) established by Peter the Great: it is from this works that the town gets its name. The works has been completely rebuilt in Soviet times and turns out many items required by the republic's economy—engines for steamers, gas-generator tractors and trailers, electric saws, axes, etc. Among the new industrial concerns are the sawmills, a ski factory which before the war produced a quarter of the skis used in the USSR, and the Soviet Union's biggest mica plant. In 1914 the population of Petrozavodsk was 20,000; in 1939 it was about 70,000.

The Karelian people composed the famous epic *Kalevala* and even today in the Karelian villages are to be found people who sing the ancient tunes. Petrozavodsk is the center of the reborn Karelian culture. Illiteracy has become almost extinct in Karelia. There are higher educational establishments and theaters in the country and a Karelian literary language has been developed.

KARELIAN-FINNISH S.S.R.

Territory—about 76,000 sq. miles (1941 boundaries).

Population: Karelians, Finns, Russians.

Neighbors: West—Finland, North, East and South—R.S.F.S.R.

Relief: Hilly plain smoothed out by the action of glaciers which have left deep furrows; patches of boulders; frequent outcrops of primary crystal rock. Highest point 1580 feet.

Chief Rivers: Kem, Suna, Vyg: until recently an important river but lost its significance when the White Sea-Baltic Canal was opened.

Lakes: Ladoga (northeastern coast) 7,000 sq. miles); Onega (almost all the lake within the republic) 3,700 sq. miles; Seg, Vyg, and Top.

Part of Russia since 10th–12th centuries (main part); western regions were cause of dispute between Muscovy and Sweden.

Soviet power established in 1917 (some of the western regions which entered the republic when it became a constituent republic of the Union—in 1940), from the time the peace-treaty with Finland was signed.

Chief Produce: timber, peat, anthracite, mica, pegmatites, granite and other building stone, sea and fresh-water fish.

Capital: Petrozavodsk.

The railway from Petrozavodsk follows Lake Onega northward. Smooth, rounded rocks are on all sides—they were polished by the moving ice. Between hills and woods there are frequent lakes. The woods grow in soil that is thickly strewn with boulders.

At every railway station there is a sawmill with a tall iron chimney that can be seen for miles towering above the woods. The woods have been cut down on both sides of the railway but there are new roads leading from the stations into the forest; the timber is brought out along these roads.

Timber is the basis of the whole national economy of the republic. The stands of timber in the country amount to over 36 thousand million cubic feet; the annual increase amounts to many million cubic feet. The felling and transport of timber is all mechanized and the rafting of the timber is now being done by machinery as well. In addition to the sawmills all other branches of the timber industry have been developed—pulp and paper, wood-chemical, ski and furniture making.

Next to the timber industry comes the mining industry (granite, marble, diabasis, and mica). There is a future prospect for the development of an iron and steel industry using the titanomagnetic ore of Pudozhgorsk (on the eastern coast of Lake Onega), which contains vanadium. The rivers are the source of power supply. A number of existing power stations burn wood as fuel.

There is a new center on the railway at the end of a lake bay that bites deeply into the coastline; this is Kondopoga. Its industries are typical of the region: a big pulp and paper mill, a

hydroelectric power station and a factory processing pegmatite.¹ The Kondopoga Paper Combine produces newsprint, wrapping paper and wall-paper. Waste from the paper mills is used for the manufacture of papier-mache goods. The power station is worked by the water from Lakes Sandala and Nigi that are at a higher level than Lake Onega: the water of the River Suna is also used to drive the power plant. The Kondopoga Pegmatite Mill is the only one in the USSR; its produce supplies pottery and porcelain works.

The railway continues from Kondopoga northward. In the new town of Medvezhegorsk where the wooded hills come right down to the water, we leave Lake Onega behind.

Our further journey takes us through another big industrial town, Segezha, which has Europe's biggest pulp and paper mill. The equipment of this mill is extremely complicated: there is one machine there which is about 330 feet long and weighs 2,000 tons. The mill manufactures wrapping and industrial paper, cellulose, paper bags for cement, fertilizers, sawdust, resin, and other products.

The railway runs parallel to the Stalin White Sea-Baltic Canal opened in 1933. The canal is 140 miles long, has 19 locks and connects Lake Onega with the White Sea. Fuel, food products, and manufactured goods go northward along the canal, while the southbound cargoes are apatite from Khibiny, fish, building materials, and lumber.

The occupants blew up the dams and locks of the canal but the splendid restoration work was completed at such high speed that the canal was opened for navigation again at the beginning of August, 1946.

The canal and the railway reach the White Sea at the same point—Belomorsk (formerly Soroka). This town is an important seaport and is a center of the lumber industry; most of the

¹ Pegmatite is a rock that consists mainly of quartz and field spar which are welded together so that a cross section of them reminds one

of letters of the Hebrew alphabet; the ground pegmatite is used in the manufacture of china and porcelain.

timber handled comes from Karelia. There is also an important railway center in the town. A branch line runs from Belomorsk southeastward past Lake Onega to Obozerskaya station on the Moscow-Archangel line. This bridging line between the two north to south lines was built shortly before the Second World War to carry loads of timber from the more easterly regions to the ice-free port of Murmansk. During the war the branch railway was of great strategic importance on account of the fact that the enemy occupied the southern part of the main line near Petrozavodsk and the branch railway served to maintain communication between the Kola Peninsula, Murmansk and the interior of the country. A considerable part of the shipments made by the allies through Murmansk entered the country by this railway.

The railway continues northward along the seacoast. We pass fishermen's co-operatives and fish packing houses where the White-Sea herring are caught and packed. The White Sea contains valuable seaweed which is still not being used to the full for the manufacture of iodine and agar-agar.

The farther north we travel, the smaller and less frequent the trees become. We pass the timber center of Kem and then Louhi where the bright green agricultural station was a pioneer in bringing farming to the Far North. Mica is quarried on the shores of Chupin Bay where the railway crosses the Arctic Circle; the station is itself called "Arctic Circle" and is the last in the Karelian-Finnish Republic.

XIII. ACROSS THE ARCTIC CIRCLE

As we look out of the window of our still northbound train, our attention is attracted by the gleaming copper wire overhead, an indication that the railway here is electrified. The railway bends round the Kandalaksha Spit on the White Sea; this promontory juts out far to the northwest. Kandalaksha itself is a lively little town and fishing center with a big railway station. It stands be-

neath a mossy, forest-grown hill at the very mouth of the tempestuous Neva which brings water to the White Sea from the big Lake Imandra in the middle of the Kola Peninsula. There is a power station on the Neva River which provides the current for our train.

Kandalaksha boasts timber-mills, a fish canning plant, an engineering plant, and, most important of all, a mining and chemical combine which uses the apatite and nepheline of the Kola Peninsula—all this tucked away in the Far North. When we stand on the threshold of this great industrial enterprise we realize the change that the discovery of the mineral deposits has wrought in the national economy.

The railway on which we are traveling cuts across the Kola Peninsula at its base, from Kandalaksha to Murmansk. Along the route is the Imandra Lake with its deeply indented shoreline that closely resembles the Norwegian fjords. To our right lie the Kirovsk Apatite Mines.

Near "Apatite" Railway Station—well within the Arctic Circle—we find the Arctic "Industry" State Farm, which supplies fresh vegetables, berries, milk and potatoes to the mine-workers. Here we shall take a train on the branch line. To Kirovsk from here it is only about fifteen miles.

The woods are already growing scanty, they are hidden in the valley while the rounded tops of the hills are bare. The center of the Kola Peninsula is very hilly; there is a bow-shaped chain of hills which at points reaches heights of nearly 4,000 feet; it contains mineral riches that have been deposited there as a result of a magmatic intrusion. Trees have great difficulty in growing at heights over 800 feet in the north, so that the process of soil-formation in this region is naturally an extremely slow one.

The little narrow-gauge train on the branch line puffs persistently up the valley of the Belaya River; one last bend in the line and we have before us a panorama of Kirovsk—the big round Lake Vudiyavr, surrounded by hills, the town where the

early log cabins are now dwarfed by permanent stone dwellings, the huge refinery and the power station. On the opposite bank there is a chain of mines and miners' housing estates. In the center of the town there is a big park which contains the world's most northerly botanical gardens. It is difficult to believe that Kirovsk, one of the most northerly towns in the world, was only founded fifteen years ago.

In the summer there are no nights at this latitude. Even on the Arctic Circle there is one day in the year when the sun does not disappear beyond the horizon—Kirovsk is many miles north of the Circle so that the winter with its long polar night is dark. The northern lights are a frequent occurrence.

As we walk round the huge buildings of the refinery built on the shores of the lake we come first to the stockpile where there are the lumps of apatite, for the sake of which this whole town was built. The rock has a gray-green or pale, whitish tone, the predominating colors in the tundra; it consists of grains of apatite, a mineral which has a high phosphor content and of nepheline. Apatite, especially the concentrate which is obtained at Kirovsk, is the world's best raw material for the manufacture of fertilizers; many of the superphosphate plants in the USSR use this apatite. Large quantities are also exported. Nepheline is a raw material which may be used for the manufacture of aluminum, glass, tanning agents, crockery, and other items. Huge lumps of this rock go crashing into the stone-breaker that looks to us like a giant coffee mill.

On the opposite side of the lake are the mines. Some of them are open cuts. The slopes of the Kukisvumchor Mountain which is composed entirely of apatite serve to form a huge quarry. In the valley of the Yuksporok River there are regular apatite mines on Mount Yukspor. There is a long inclined runway from these mines to the branch railway below.

In the Kirovsk Museum there is an excellent collection of minerals found in the Khibiny Tundra. There are various samples of the apatite-nepheline rock, urtite, another variety of

nepheline, eudialyte, titano-magnetite, zircon, the gray "khibinite" and dozens of other minerals which were first discovered in this region. In the museum we get some idea of the variety of the geochemical complex on the peninsula, of its tremendous richness and its great importance both to science and to the national economy. The stations on the "apatite" branch of the railway all have mineralogical names—Nepheline, Titan, Apatite, etc.

The geological study of the Kola Peninsula, especially of the Khibiny Tundras, has been carried out by Soviet geologists who began this work in 1920; the study and the results obtained are a good example of what can be done by a planned attack on a white spot on the map; no halt was ever made on account of weather conditions or terrain, and year after year, ever increasing numbers of geologists all working in accordance with a similar plan took part. The whole work, especially the discovery and working of the apatite deposits is closely bound up with the name of Academician Fersman whose recent death was a great loss to Soviet science. Fersman compared the general conception of the geochemical make-up of the Kola Peninsula which he developed with the scanty descriptions of former explorers and pointed to the absolute certainty of finding apatite deposits there; his persistent labor was rewarded far beyond his fondest hopes. Of the many half-legendary stories concerning the discovery of whole mountains of apatite, the following is of special interest: when a young geologist named Labuntsov first drew the attention of his colleagues to these mountains and insisted that they were solid apatite, nobody believed him for such a mass of a mineral that is comparatively rare on the earth was beyond all conception.

The building of the apatite mines and the town of Kirovsk is in itself an epic. The greatest difficulty lay in the fact that the region was completely uninhabited; except for a few families of nomad Lapps (Saami) with their reindeer. The severe winter, with its almost continuous darkness lasting several weeks, the

complete absence of all roads, the lack of any sort of local food supply and even the timber for building, the deep snowdrifts in the mountains, the blizzards that make it impossible for a human being to go out of doors—all these were overcome in the course of two or three years.

Beyond the mines there is a beautiful little building on the shores of Lake Vudchiarvr: this is the Academy of Sciences base known by the Lapp name of *Tietta* which means light, where scientists are continuing their study of the mineral riches of Khibiny.

After leaving the “mineralogical” railway stations we continue northward along the main line to Murmansk. On our left we pass Monchegorsk, where complex metal ores are mined; the history of Monchegorsk is similar to that of Kirovsk except that it is six or seven years younger. Communication with Monchegorsk is obtained either by the branch railway which runs around the northern end of Lake Imandra or across Imandra and a string of smaller lakes—in summer by motor boat and in winter on ice-boats. The country around Monchegorsk resembles that around Kirovsk—the same tundras, bare hill tops, and scanty vegetation in the valleys, mines, and settlements scattered amongst the hills and on the shores of the lakes with a “central town.”

XIV. THE ICEFREE ARCTIC

THE train is now nearing Murmansk and although we are still traveling north we do not feel the climate growing any more severe; on the contrary, it seems to be improving. The worst climate on the whole Kola Peninsula is in the central part; in the more northerly parts the influence is felt of the easternmost branch of the warm Gulf Stream which keeps part of the Barents Sea free of ice all the year round. The stream comes all the way from Florida, brings warm water from the Gulf of Mexico near the equator to warm the whole of northwestern Europe. Owing

to this warm current the port of Murmansk is free of ice during the long polar night. The air is frosty and the dark waters of the Murmansk Fjord seem to be smoking as the evaporating water is immediately frozen into mist and fine ice dust.

Murmansk is the most northerly of the world's big ports (population in 1939 was 117,000). The neighboring Norwegian ports on the same parallel—Varde, Hammerfest, and Tromsö—are incomparably smaller. The ports of Iceland and Alaska, to say nothing of Canada, are much farther to the south. It seems strange to us as we stand in Murmansk that we are on the same parallel as Central Greenland! The railway on which we came here is the northernmost in the world; it is not a little branch line but a main-line railway, large parts of which have been electrified and which connects a very important port (important because the Baltic and White Sea ports as well as the more easterly Arctic ports all freeze in winter) with the interior of the country. The port of Murmansk has an interesting history. Due to the extreme short-sightedness of the tsarist authorities this part of the northern seaboard was not considered of any importance until the First World War despite the fact that enterprising Russian merchants in the sixteenth and seventeenth centuries engaged in trade with foreigners at the port of Kola which is close beside the present Murmansk. The monks of the Russian Monastery of Pechenga (Petsamo) nearby organized a large-scale fishing industry and sold their catches to Norwegian and Danish merchants. It is true that this trade did not last long: for the purpose of imposing customs duties all foreign trade was soon concentrated in Archangel which had better connections with the interior of the country on account of its rivers. The First World War aroused the tsarist government to take decisive measures to build up the port of Murmansk and a railway connecting it with the interior of the country. The harbor is a natural one with deep water well protected from the winds, but the building of the railway along which we have just traveled, was a tremendous engineering feat. The speed with which the rail-

way was built in an uninhabited region with an extremely rigorous climate, was a record. By 1916, Russia whose ports in the Baltic and Black Seas were temporarily cut off, already had the port of Murmansk and the railway to it with which to maintain contact with her allies, Britain, France, and later the U.S.A.

Naturally, the railway that was built in such a short time was far from perfect and was completely rebuilt in Soviet times; the last phase of the improvement scheme was the electrification of the railway using the current supplied by the hydroelectric power stations on the rivers Neva and Tuloma (in the immediate vicinity of Murmansk). The Red Army and the Northern Fleet of the Red Navy kept Murmansk in their hands throughout the war and it again proved a port through which war freights could flow into the country. Thousands of heroic British and American seamen visited this port during the war.

The harbor was also considerably rebuilt in Soviet times. The old wooden barracks where the first workers lived are still to be seen but there are also five and six-storey houses, there is the Hotel Arctic and a club with an auditorium that many a town theater might envy. The town is still in the process of construction; its population increased thirteen times over between 1926 and 1939. This is almost a record even for the USSR where towns grew very rapidly in the period of industrialization. It must not be forgotten that Murmansk is the northernmost of all big towns in the world. The Germans destroyed the town during the war by constant air raids.

The population of the town lives by the port and the fisheries. There are always piles of barrels and boxes on the shore which are packed with herring, cod, skate, haddock, and other fish. The catches of the huge Murmansk fishing fleet find a ready market in the USSR and abroad. Most of the fishing is done by big trawlers who clean and gut the fish out at sea so that they have no need to hurry back to port but can work over a large radius. There are also a number of fisherman's co-operatives organized by local-born fishermen. They have pooled their re-

sources and now own motorboats and motor schooners for fishing.

The Murmansk Fjord in spring and summer is unforgettable. For months the sun does not go beyond the horizon (the latitude is almost 70°). The fjord is surrounded by low flat hills with low scanty vegetation; the snow melts only in midsummer. The exit from the fjord to the sea is many miles from the town so that the harbor is like a huge mountain lake with clear blue water in summer. Huge sea birds with a wing-span of over three feet skim over the water. The sun shines through their white wings giving them the appearance of fine porcelain.

XV. BY AIR TO THE POLE

OUTSIDE the Murmansk Fjord, beyond the Island of Kildin which stands like a sentry at its mouth, there is the forbidding Barents Sea. Through this sea go routes to all parts of the world: nearest of all, however, is the Arctic. Murmansk port has played a very important role in the conquest of the Arctic. This was the starting point of the route followed by the local sealers since the seventeenth century in their regular trips to Spitzbergen and Novaya Zemlya.

The Kola Peninsula is only the beginning of the "real" Arctic, but it is quite near. If we take a seaplane from Murmansk and fly out over the Barents Sea, gloomy even in midsummer, we come to the region of ice-floes within a few hours; soon we land on Franz Josef Land. It is a black stony island almost devoid of vegetation; snow lies all summer through on the tops of the hills and in the deeper valleys. In this archipelago the northernmost island belonging to the Soviet Union is Rudolph Island. The northernmost settlement in the Soviet Union is the little group of wooden houses built on Rudolph Island, in the year when Soviet polar explorers, using a near-by natural snow aerodrome that never thaws even in summer, mapped out the air route to the famous drifting ice station "North Pole." At the sta-

tion on Rudolph Island there is a small population of meteorologists and radio operators.

A few hours more flying over the Arctic and we come to regions where there is no longer open water with ice-floes but a continuous field of ice with occasional cracks where the water shows through. Sometimes the ice piles up into huge icebergs, the only relief on that monotonous white field that stretches to the horizon.

Suddenly our aircraft begins to circle. The North Pole! Here the imaginary lines that mark the boundaries of the arctic section of the USSR meet. A pace in any direction from here will be a step to the south. We look excitedly at the ice below us—it is the same continuous field of ice broken by occasional crevices—only the navigator can tell which spot is the North Pole!

Involuntarily we look for the tent, wind-motor, and red flag. At this point in 1937, at the place where all the meridians meet and which has about 14,000 feet of water under it, four Russians landed: they were Papanin, Krenkel, Shirshov, and Feodorov. They made meteorological, oceanographical, and magnetometric observations; the radio kept them in communication with Moscow and the whole world. The currents gradually carried the ice-floe on which they landed from the Pole toward Greenland, a distance of over 1,600 miles; there the ice floe fell to pieces. Soviet ice-breakers, making their way through the ice almost a year later picked up the gallant four and brought them back to the mainland.

5. ACROSS THE NORTHERN WOODLANDS TO THE URALS

I. THE GATES TO THE NORTH

RUSSIA HAS LONG BEEN KNOWN as the "Land of the Polar Bear." This false conception of Russia as a northern country does not only come from detective and adventure stories who use the "snows of Russia" as a background for thrilling situations: Voltaire, Byron, and Stendhal all sinned in this respect. They took the severity of the Siberian climate as typical of the whole country. The first journeys we made in this book showed us that the USSR is not the land of ice and cold that many authors since Herodotus have described. It is true that we have just seen a small part of the Arctic, the northern islands, and have even been by air to the North Pole, but then how great was the expanse of warm lands that we visited between the Caucasus and the Crimea? It is true that there are parts of the Soviet Union that have extremely cold winters, colder than those of Western Europe. But this is still not the country of men dressed in furs and traveling on dog or reindeer sledges described in the adventure stories of Western Europe. Perhaps if we go due north from Moscow we shall see something of this.

Due north from Moscow we pass through Yaroslavl, Vologda, and Archangel to the White Sea and then to the ice-bound shores of the Arctic Ocean. We by-pass Pechora where the

Zyryans and Samoyeds live. If we again travel southeast from there we shall get to the Urals, another region of which we have heard many marvelous stories.

To begin with we have the well-known Moscow landscape, small towns, factories, country summer cottages, woods that have been turned into parks. Within six or seven hours we again enter Yaroslavl and cross the sparkling waters of the Volga by a bridge. We shall not, however, stop until we get to Vologda, the real gateway to the enormous wooded region of the north.

The monuments of this town tell us of its importance in the past. The very name Vologda comes from the Russian word *volok*, a portage; Vologda stands in the middle of the great water divide which separates the Upper Volga and its tributaries from the basin drained by the northern rivers—the Sukhona and the Vaga, which fall into the Dvina, Onega, and Vitegra. This is a land of portages, the place where it was most easy to transfer loads overland from the upper waters of one river to those of another. Some of these rivers are now connected by canals; in the vicinity of Vologda itself there are hydraulic engineering works connecting the Volga through the Sheksna, Lakes Beloye and Kovzha with the Vitegra, connecting Lakes Onega and Ladoga, the Baltic Sea and the Sheksna (and therefore the Volga: this is the Mariinsk Canal System) through Lake Kuban and the Sukhona River. In the olden days these were all portages that played an important role in trading. The whole country that lay beyond this portage region—Moscow and Novgorod Rus—was called simply *zavolochye*—Transportage-land—by the local inhabitants.

Vologda stands on a small river of the same name which falls into the Sukhona about twenty miles downstream. The town has spread over both banks of the river and its center is on the right bank. Here we find the “Assembly Hill” or forum, the Kremlin surrounded by white walls and containing some dozen ancient cathedrals and churches. The architecture of these buildings dates back to the sixteenth and seventeenth centuries, the

period when the town reached its zenith. Trading began to take on especially big proportions in the sixteenth century, when Vologda became a central entrepôt for the goods that passed along the chief foreign trade route through the north. This period was one of great change in the life of the State of Muscovy, especially of its northern regions. In 1553 Sir Hugh Willoughby's expedition equipped by the English Company of Merchant Adventurers for the Discovery of Regions, Dominions, Island and Places Unknown, "discovered" the northern coast of Muscovy almost as accidentally as Columbus discovered America. The expedition was equipped to find the North East Passage to China and was the first of numerous expeditions which set out with the same object. One of the vessels of the expedition, that commanded by Richard Chancellor, was driven by a storm into the mouth of the Northern Dvina on the White Sea. This, incidentally, was the only vessel that escaped destruction. To their great astonishment the English sailors did not meet people with dogs' heads or people who died every winter to be resurrected again in spring, such as they had learned to expect from European chronicles and cosmography: they did not even find ordinary hostile savages but Russian people who knew the value of their land and its riches, industrious peasants, monastery scribes, and experienced merchants. The Englishmen were taken to the military governor who received them with honor and with great hospitality. The Muscovites proved to have a civilization of their own and were prepared to enter into business relations as equals.

Chancellor and his companions went to Moscow to visit Tsar Ivan IV (known as the Terrible) and thus became the first English ambassadors and merchants in Russia.

The success of the subsequent trading richly rewarded the Merchant Adventurers' Company for their initial failure to find China in the same way, as the exploitation of America, discovered sixty years earlier, was sufficient reward to Spain for not having found the route to India. The Company, afterward re-

named the Muscovy Company, was granted important privileges by the Russian government.

The discovery of Muscovy was the first big English overseas discovery and the formation of the Muscovy Company preceded that of the East India Company as an important monopolist trading concern.

The vessels of other countries, especially of Holland, followed the English to the port of Archangel which grew up along the estuary of the Northern Dvina. The chief entrepôt, the warehouse town for Russian and foreign goods, was Vologda.

There are many other fine churches and monasteries in Vologda apart from those on the Assembly Hill. The Empire-style buildings on the town square, built very much later, are also worth seeing. The streets of the town are built up mostly with one and two-storeyed timber houses. The streets are very green, they are lined with trees and almost every house has a front garden. The whole town with its little river, the cupolas of its churches and monasteries, the boardwalks in the streets along which goats amble lazily, the shady boulevards that have been built along the old rampart and moat—all bears the mark of a goodly provincial town, with an unhurried business life and the very evident remains of a strong patriarchal life.

At the same time Vologda is still an important economic center. The little old workshops and factories have developed into modern industrial concerns. To these have been added new factories, amongst them a long chain of buildings that forms the "Linen Combine." Flax has for centuries been the speciality of Vologda Region where agrarian Muscovy merges into the northern forestlands. There is sufficient moisture for flax and everywhere fields of the little blue flowers show up between the fields of golden corn and the darker masses of the woodlands. Vologda lace is well known throughout the USSR and abroad—it has a simple but elegant geometrical design. The lace-makers have formed co-operatives and turn out some fine works of art.

Dairy farming is also important in the Vologda Region and

there is a special Institute of Dairy Farming in the town. The rich water meadows provide excellent fodder and the Vologda milk is thick and creamy. Everybody who has visited a farm here remembers a hospitable peasant woman who took an earthenware jug half full of thick cream out of her ice-well and offered it to the guest with a big chunk of black rye bread. Butter, condensed milk, and various cheeses are, therefore, important items in Vologda's economy.

A number of engineering concerns have been built here in Soviet times which manufacture equipment for the sawmills, timber-carrying trucks, engines for tugboats on the northern rivers; there is also a wood-working and food industry. The locomotive repairs shops of Vologda are important as this is the junction of the main line from Moscow to the North and from Leningrad to the East.

On the Sukhona River, near Vologda, there is a group of paper mills which use timber floated down the rivers to them. Nearby is the town of Sokol, a new town that has grown out of a number of factory housing estates. Some of these are old factories, others have been built since the Revolution.

The route to Archangel lies through the famous northern forests. The still unexhausted forests of the Soviet North form a timber exporting region of world importance. Some of the larger kinds of timber—telegraph poles, Dutch piles, big baulks, etc. are sent all over Europe from here. The Russian sawmills also provide the larger sizes of sawn timber. The quality of the timber supplied by the northern forests of the Soviet Union is unrivalled. Hundreds of foreign vessels come to the northern ports, especially Archangel, for wood.

The railway runs in a straight line from Vologda, past Sokol to the north, with dense forests on both sides; the pines and firs almost touch the carriage windows and are rarely broken by open glades, little villages and railway stations. The landscape prepares the traveler for his entry into the "timber metropolis." As we approach Archangel, we see ever larger numbers of long

trains in sidings loaded with sweet-smelling freshly sawn boards, or baulks of timber so fresh and clean that they seem to have been washed. The people on the stations are talking the language of the lumber camps, they speak of raftings, of timber stands, of summer fellings, of timber roads: there is timber everywhere, on the rails, on the sidings, and in the conversation of our fellow-travelers.

II. THE TIMBER CITY

ARCHANGEL lies at the mouth of the Northern Dvina but it is still over twenty-five miles to the sea from the city. The town stands on a moraine height overlooking the river which at this part is beginning to spread; between its central part and the sea the estuary of the Dvina forms an extensive delta with numerous islands. At first glance the landscape in the vicinity of Archangel is dull and uninviting—on all sides there are low islands which are under water at flood time, some of them at every high tide; the youngest of these islands are not yet fully shaped—sand bars that have gradually built up; they are covered with osiers, reeds, and salt-loving vegetation. The older islands are mostly swamps with sphagnum moss caps in the center which get its nourishment from the rains that do not have time to evaporate in the humid climate of Archangel. The swamps are surrounded by trees, but they are dwarf trees stunted by the surplus of moisture and the savage breath of the near-by subarctic seas.

If we look closer, however, we can find beauty in this dismal landscape. In the summer the swamps are filled with flowers and berry bushes; the plants seem to be in a hurry to take advantage of the short summer and cover the whole swamp area with ferns, mare's tails, mosses, and emerald green grass. Even the dwarf pines seem to lose their downcast appearance and stand up boldly to give off their typical pitchy odor. In places where there are no swamps (near Archangel there are some spots on higher ground covered with forest) this short summer is es-

pecially appreciated—it is hot, river bathing is possible and here and there there is a rapid growth of vegetation.

The chief beauty of Archangel, however, is in the Dvina River, with its constantly changing colors. It pours out of a bed three-quarters of a mile wide and splits into the sleeves of the delta. Opposite the city the Northern Dvina spreads over a considerable territory and the numerous vessels there give it a maritime appearance. The low banks of the islands in the delta that are about two miles away from the center, are out of sight. The hues and tones of the river are constantly changing; in summer they have those azure tones that remind one of the Black Sea, of the Crimea; on a stormy day they are like lead with the white caps of the waves dancing over the water. The Arctic Circle is quite close and in the summer months the sun scarcely disappears behind the horizon; there are wonderful sunsets that paint the river with inimitable color schemes and they seem to merge into the equally glorious sunrises when the whole horizon is a mass of rosy, orange, green, and blue tones. The reflections of this gamut of colors are woven into fantastic patterns by the ripple on the waters.

If you go out to the middle of the Dvina, a fine panorama opens out before your eyes; the white buildings of the town are massed close to the river not only on account of the huge peat bogs which hem it in from the land side, but also because the whole life of Archangel is closely bound up with the water front. The open roads opposite Archangel are filled with constantly moving shipping. There are large lumber-carrying vessels, ice-breakers going out into the Arctic, the vessels of hydrographical expeditions, the schooners of the sealers. There are tugs hauling big rafts of logs, sea tugs that do not look like the ordinary river vessels. Large passenger carrying paddle steamers come and go making their way cautiously between the fast-moving motor boats that dart here and there. From the center of the city there are river trams in all directions; these connect the center with the numerous sawmills, lumber yards, and suburban settlements.

Archangel, however, is not only this city we see from the center of the Dvina—it also stretches for thirty miles along the arms of the delta. There are sawmills everywhere where there is a sufficient depth of water for sea-going vessels and a sufficient expanse for the rafts. The huge logs are drawn out of the water by the chains which hold them together in rafts, are sawn and stacked in the huge lumber yards whence they go direct into the holds of Soviet and foreign timber vessels. Even from the air it is impossible to see the whole of this expanse of timber yards and sawmills at one glance: it is two and a half hours' journey on a river from the center to the end of the main chain of sawmills, timber yards, and settlements along the Maimax, the chief branch of the Dvina. The lumber yards end only at the sea. There are chains of mills and lumber yards almost as dense along the Nikolsky, another branch of the river, and also upstream. Around Archangel there are twenty-five huge sawmills with their extensive yards, five lumber yards handling only logs, a sawmill turning out railway ties and several shipyards. The Archangel timber industry absorbs nearly thirty million cubic feet of timber a year and the average sawmill consumes several tens of thousands of logs. The whole of this mass of timber has to arrive during the short summer navigation season and must be brought ashore: by autumn, towards the end of the navigation period, the Maimax, the main branch of the Dvina is a narrow corridor between high stacks of logs at every sawmill; the lumber yards are almost bare of sawn timber by this time, for it has all been taken away. By spring the picture will have changed completely; the stocks of logs will have dwindled to almost nothing and the lumberyards will be full of neat stacks of sawn timber that look like little wooden houses from a distance.

The waste from the sawmills which was formerly a nuisance (it had to be removed and dumped into the swamps or burnt on huge fires, a tiresome job) now provides raw material for the pulp and paper mills and the chemical plant.

In the winter, when the river lies deep under a thick sheet

of ice, when the sawmills and lumber yards are lost during the day amidst the thick snows, there is an extensive belt of bright lights encircling the town—the lights of the sawmills, lumber yards, and the settlements.

III. ACROSS THE NORTHERN SEAS

FOR our trip across the White Sea and other northern seas we take a ship at Archangel. We pass down the narrow corridor of the Maimax past the low, desert Mudyug Island where there is a monument to Civil War victims; the counter-revolutionaries maintained a concentration camp on the island in which they imprisoned supporters of the Soviets. The island lies right in the sea and from here our sea passage begins. The colors are the soft northern type, all pastel shades—a pale blue sky, the smooth, whitish surface of the sea, and the greening shores are all so different from the southern oil colors.

The White Sea is really a deep bay in the Barents Sea. The warm Gulf Stream does not reach here and all except the central part of the sea is covered with thick ice all winter. There are particularly big concentrations of ice in the “throat” of the White Sea where it joins the Barents. The most powerful ice-breakers are used to maintain communication with Archangel in winter.

The Northern Dvina and other big rivers make the water of the White Sea very fresh. It is said that old sailors making their way home in the fog can tell when they have passed through the “throat” by the taste of the water.

There is a group of islands in the middle of the White Sea where the Solovetsky Monastery was built in the fifteenth century. For a long period the islands were a religious center for the fishermen and sealers from the shore settlements and for the sailors of this region and were also an economic and organizational center for the development of that still desert region. The monastery built settlements and wharves for the fishermen,

plowed the soil and settled peasants on the lands it obtained from the state. At times the monastery with its strong defensive walls, like many other Russian monasteries, played an important strategical role. During the Crimean War (1854-55) it withstood the bombardment of the British Fleet. In the coastal settlements there is a poetic legend to the effect that in response to intensive prayers of the monks all the seagulls in the White Sea gathered together and with their snow-white wings hid the Russian shrine; the British guns, therefore, fired into empty space.

As we leave the White Sea we come into the main sea route leading to the eastern Arctic ports of the USSR, to the Siberian coast. This is the western, most intensely used section of the through passage from the Atlantic to the Pacific Ocean which became a regular sea route in 1935. The systematic exploration of Russian Arctic travelers who at times performed deeds of great heroism, the establishment of a chain of meteorological and radio stations, the maintenance of a number of powerful ice-breakers each patrolling its own section, the aerial ice surveys, and the building of ports and bases in the north, all helped toward making the ancient dream of many seafarers come true—they not only opened the "North East Passage," but they regularly operate it.

The western end of the Northern Sea Route carries the greatest amount of traffic. Taking advantage of the short summer navigation season the vessels visit the estuaries of the rivers that fall into the Arctic Ocean, following the ancient route of the Russian sealers, whalers, and explorers.

For the time being we shall not travel far to the east—beyond Novaya Zemlya through the Kara Gates and the Yugor and Matochkin Straits into the Kara Sea, but will visit the mouths of the rivers that belong to the Archangel Region.

The nearest river to Archangel, is the Mezen which enters the sea just outside the "throat." It comes from densely wooded regions and is therefore used for rafting lumber. At the mouth of

the river there are sawmills and lumber yards so that it is like a miniature Archangel. Although the seas that wash the shores of the Soviet Union are almost tideless at the mouth of the Mezen they are very strongly felt—twice a day the tide goes out for a distance of six miles. Vessels cannot, therefore, tie up along shore but must stand out in the roads over the deeps in the seabed that at low tide are like lakes. There is a township called Mezen, a group of sawmills and log cabins.

There are good stands of timber only on the upper reaches of the rivers, nearer the mouth the trees are scarce, the ground swampy, closely resembling a typical tundra.

We sail on eastward, round Cape Kanin which juts a long way out into the sea in a northwesterly direction, pass the Island of Kolguyev where we can see herds of reindeer on the summer pastures if we use our field-glasses, and into the mouth of the biggest river in northeast Europe, the Pechora.

At the mouth of the river stands the town of Naryan Mar, the center of the Nenets National Area. Here we see nothing but real tundra—the Little Tundra on the right bank. The tundra is a flat, broken plain covered with frozen swamplands which thaw on top in summer when the tundra is damp. There are occasional bushes, still less frequently dwarf birch trees which almost creep along the ground. The tundra is the kingdom of moss and lichens, the most useful of which is the Iceland Moss on which the reindeer feed. There are many northern swamp berries; the general color of the tundra is whitish-green.

The Nenets people are the aborigines of the tundra. They engage in reindeer breeding, fishing, and hunting and to a considerable extent lead a nomad life. The chief wealth of the Nenets is their reindeer herds which number many thousands of animals. Their clothing is made from reindeer skins and is eminently suited to the tundra climate being the result of many centuries of experience. Soft, warm boots are also made from reindeer hide; they are stitched with the sinews of the same reindeer and are practically waterproof. It is no wonder that the

Russians and others living and working in the north adopt fully or partially the costume of the Nenets. Excellent suede is made from the skins of young reindeer.

In the tundra the reindeer is the chief means of transport. Harnessed in pairs (sometimes three or four in a team) to a light sled they move faster than a horse on a good road; they have no need of roads and go straight from one point to another, in winter over the snow and in summer across the soft slippery swamps of the tundra.

The Nenets, like other northern peoples, are excellent bone carvers; they use walrus tusks (which are quite as good as ivory) for their carvings; they also carve the fossilized tusks of the mammoth which are frequently found in the frozen tundra sub-soil. The mammoth tusk differs from ordinary ivory by its yellow hue.

Naryan Mar, despite its modest dimensions, is a busy township. This is due to the fact that it is the chief town of the area and is also a seaport, the gateway to the rich Pechora Region. The Pechora is used to raft timber from the dense and almost untouched forests on its upper and middle reaches; in Naryan Mar there are naturally sawmills which, indeed, are now a feature of every northern town situated at a river mouth. Merchant vessels and the sealers' schooners come and go, geological expeditions pass through the town, the Nenets come from the tundra to buy hunting equipment, flour, and other necessities, to hand over their furs and skins to the state factory and to bring in their children to be educated in the boarding schools at Naryan Mar. The town contains a number of educational and entertainment establishments for the local population and for the Nenets who live in the tundra; there is also a big hospital.

During the past few years farming has been developed on quite a large scale to serve the needs of the township and the surrounding district. The chief crops are vegetables which are grown in the open despite the fact that it is far beyond the Arctic Circle.



OLD AND NEW, NORTH AND SOUTH

ABOVE:—A North Russian village church, with wooden crosses
in the graveyard.

BELOW:—Workers' club on a collective farm in the Crimea.

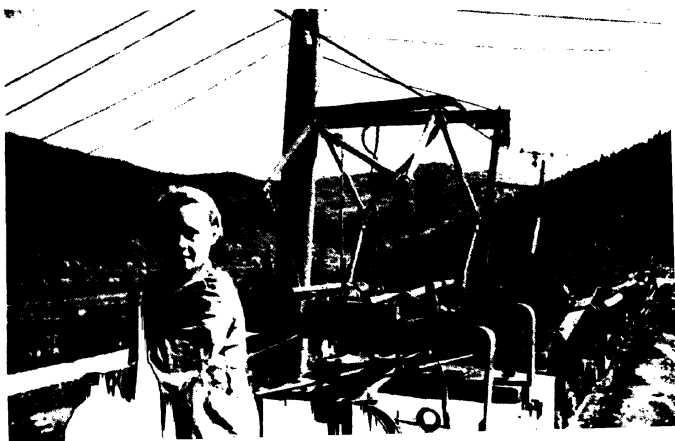




THE INDUSTRIAL HEART

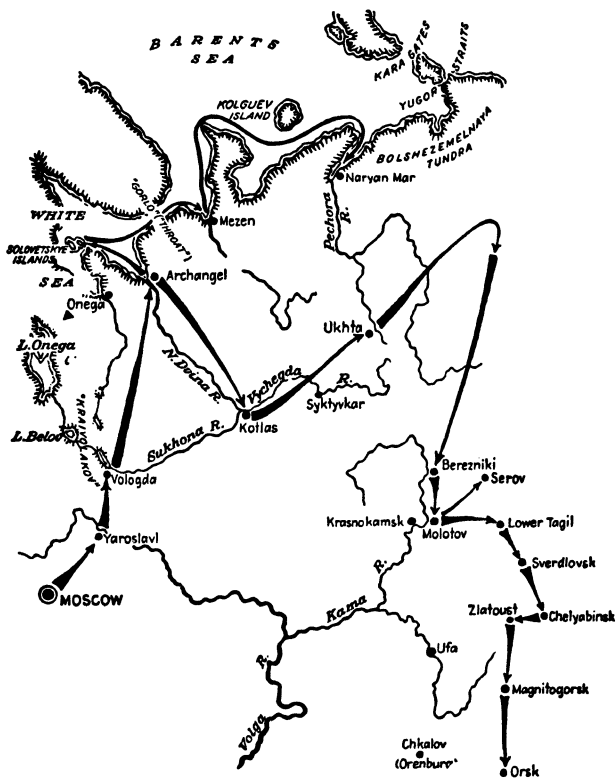
ABOVE:—A typical scene in the Donetz Basin, industrial heart of the Ukraine.

BELOW:—Brakewoman on an ore train from the Ural mountains.



There are veterinary stations in the tundra which fight against diseases in the reindeer.

The people of the north are resourceful, thrifty, and coura-



geous. The Russian fishermen and sealers (Pomors they are called) have lived for centuries in a perpetual struggle against the northern elements where they plowed the icy wastes on their frail cockleshells. The descendents of the Pomors are the seamen who man the Archangel vessels today. The various stages

of the conquest of the Northern Sea Route, the return of big expeditions, the trans-polar flights—any of these episodes was invariably connected with Archangel which is either the starting or finishing point of each expedition; many Archangel people, therefore, took part in all these expeditions.

During the war the enemy was not far away but the town stuck at its important job of maintaining sea communications between the USSR and the allies. On bitterly cold and frosty nights the Archangel ice-breakers brought convoys of ships through to port, cutting dark lanes of water in fields of ice that are white even on a dark night.

IV. DOWN THE RIVERS TO FOREST DEPTHS

Now let us go the other way—from Archangel down the Northern Dvina into the land of great forests.

The vessel we board is of the same type as the Volga steamers but necessarily much smaller. There is a strange northern beauty about the river. The banks are at times steep and broken, then they spread into luscious meadows which serve to pasture the herds of excellent northern cattle. The Kholmogory cows are a favorite with Soviet stockbreeders; they take their name from the town of Kholmogory, about a dozen miles from Archangel, where Lomonosov (1711–1765), the great Russian scientist, was born. Lomonosov founded the Russian Academy of Sciences and Moscow University.

Tugs pulling rafts of timber pass us as we steam upriver. There are booms across the mouths of the tributaries to catch the logs that are floated down them; at these points the rafts are made up for the further journey downstream to Archangel. The tiniest river that can carry a log is used for floating timber and the logs are just thrown in to come downstream as they will where they are caught by the booms.

The whole region lives on lumber; even where the villages

have plowlands and large herds pasturing on the excellent meadows, the men fell and float timber. Most of the felling and trimming is done in winter when it is easier to transport the logs to the rivers. The lumbermen pile all the logs up on the banks of the rivers and when the spring floods set in, they simply float away.

Second only in importance to timber are the furs of the northern woods. In this region which at first seems so stern and formidable, the collective farmers are all rich. The men are strong and well-built, the women, tall, stately, and rosy-cheeked. There is nothing of the provincial about the dwellers in the northern forests. In an average family the son is a ship's engineer sailing somewhere between Archangel and Spitzbergen or between Mezen and London, in another the father is a river pilot who has seen much, in a third the brother is a stevedore in Archangel and from him half the village has learnt to understand a lot of English and Norwegian. The mother of a big family thinks nothing of traveling to Leningrad or Odessa to meet a son who has arrived from a long voyage. In the north people age slowly. A healthy, middle-aged woman will board a river steamer and will travel a long distance with several transfers on different railways, will call in at Moscow on the way, and return home safely after a journey of thousands of miles—all the way with her little village trunk which is now full of purchases made in Moscow and gifts from overseas which her son has brought her.

The vessel takes us up the Dvina to Kotlas. The Dvina is formed from two rivers—the Sukhona (which we saw at Vologda) and the Vychegda. Kotlas is the most important transport center in the north. The town itself seems to be nothing more than an appendage to the railway station and the wharves. Three water ways and three railways all meet at Kotlas. On the steep bank, built up with numerous warehouses and good yards, is the big timber building of the river station. The floating landing stage below is reached by a long wooden staircase. From the upper building there is an excellent view across the huge plain

where the Sukhona and the Vychegda join to form the mighty Dvina. Steamers come and go in various directions, tugs fuss along towing strings of barges and rafts. The smoke from their funnels can be seen for a great distance in the clear northern air. There is always bustle in the town: parties of lumbermen come and go, the raftmen are returning to their villages, a group of young men and women are boarding a passenger steamer to attend college in Archangel. People are traveling roads that lead to all parts of the north. The North is connected with the Urals through Kotlas which alone makes Kotlas a busy center.

At Kotlas there are the usual sawmills, shipbuilding, and ship repair yards and at Limenda, nearby, there is a pulp and paper mill. The roads to the Komi Autonomous Republic begin at Kotlas—the river route along the Vychegda and the new North Pechora Mainline Railway which was completed during the war. The river journey takes us to the southern and more densely populated part of the republic and to its capital Syktyvkar.

As we make the journey on a small river vessel that slowly crawls up the Vychegda we see nothing but densely forested river banks with little townships at long intervals. One of them, Solvychegodsk, the first halting place after leaving Kotlas, was the place to which Stalin was exiled from 1908 to 1911; he escaped from here on two occasions to continue his revolutionary work.

While the steamer is standing in the river we have time to admire the steeple of the seventeenth-century monastery and the steep slope of the bank covered with moss-grown boulders. The Vychegda is the Dvina on a small scale. All round us there are dense forests—silence; the postal aircraft high up in the sky seems like a messenger from another world.

The capital of the republic, Syktyvkar, stands at the confluence of the Vychegda and its chief tributary, the Sysola; it is a small town of log houses, where big new buildings are now going up on streets that are overgrown with grass—hotels, schools, banks, local offices, and a pedagogical institute have

already been built. There are some new sawmills. Syktyvkar lies at a distance from the railway and is connected with the outside world by the quiet and not over-big river Vychegda in summer and by motor road to Murashi, near Kirov, in winter.

This region, which was formerly the home of a people of little culture, became an autonomous republic under Soviet rule and has succeeded in making up for much lost time to take its place amongst the best national republics of the USSR.

The new economy of the republic which is developing along the North Pechorna Railway is progressing with real seven-league strides.

V. THE NEW ROUTE TO PECHORA

THE railway penetrated deep into the Komi republic and enabled man to take a firm grasp of her natural riches—oil, coal, rare elements, and gases.

The railway from Kotlas is at first a straight line out through the dense forests following the left bank of the Vychegda. At Yarensk it crosses the river by a new bridge and is again a dead straight line through the forests to the oil fields on the River Ukhta in the Pechora Basin.

In the depths of the taiga nature has created a wonderful geological and chemical complex. In the middle of the forest there are oil derricks and houses for the workers nearby; there are bigger buildings of the oil refineries and laboratories, the squat cylinders of the oil tanks and the bigger gasometers. Building is going on everywhere, new houses for the engineers and oil workers are being built at top speed. Beyond the Ukhta the railway goes in a straight line to the Pechora.

At Ust-Kovzha we get our first sight of the majestic river that reminds us very forcibly of the Kama which we saw in an earlier journey. Here man has become the supreme master of the forest, the tundra and the river. Rafts of logs go some six hundred miles down the Pechora to Naryan Mar where they will be

sawn into planks. We see the huge barges loaded with the North Pechora coal which makes it unnecessary to haul coal over long distances to the north.

Farther to the northeast we reach the banks of the Vorkuta, a tributary of the Usa which flows westward from the North Urals. This is the coal country. Beyond the Arctic Circle, in a region that until recently was absolutely uninhabited, well over a thousand miles north of Moscow, there are huge coal mines and whole mining villages. The primeval silence of the tundra is now disturbed by locomotive whistles.

The Pechora workings consist of a number of veins of coal with varying calory coefficients, and other qualities; a large part of the coal makes a good coke which has led the geologists to make intense searches for iron. Some successes have already been achieved.

Perhaps the Pechora coke will go to the Urals which is not very far away. Perhaps even this formerly uninhabited wilderness will become a new iron and steel center.

The Pechora takes its waters from the slopes of the North Urals; its upper waters are close to those of a tributary of the Kama, the Vishera; this is the Kama-Pechora river system to which the Vycheгда may also be added (at the beginning of the nineteenth century there was a small canal between the Vycheгда and the Kama but it was later abandoned) where it is intended to build a big reservoir on the flat divide of the three rivers. This will divert part of the Pechora waters into the Kama and thus increase the supply of water to the Volga system; the project will improve the working of the hydro-electric power stations on the Kama and the Volga and raise the Caspian.

VI. THE STONE BELT

THE Pechora has brought us to the Urals. The railway at present in use goes by a roundabout route from the Komi A.S.S.R. to the Urals: we should have to return to Kotlas, from there travel

south to Kirov, and then turn east to the Urals. We shall take the easier route and go by air across the endless ocean of forests to the Urals with its tremendous mineral wealth. We shall see the whole mountain range from the frozen north to the hot, dry steppes of the south. The long chain of mountains stretches from north to south over a distance of about 1,200 miles and forms the natural boundary between Europe and Asia. In days of old the Russians called this densely wooded, serrated boundary to their country the "Earth's" or "Stone Belt."

The Urals mountains are a treasure house of untold mineral wealth. In the course of millions of years water and winds, heat and cold have eroded the mountains and laid bare the minerals which they contain. Along the whole chain there are huge deposits of high-grade, pure iron—Mounts Vysokaya and Blagodat at Tagil, Mount Bakal at Zlatoust and Mount Magnitnaya in the south. Along the whole range copper has been discovered—at Krasnouralsk, Sverdlovsk, and Orsk. For the chemical plants there are potassium salts and sulphurous pyrites. There are large quantities of oil, gold, nickel, and bauxite (raw material for aluminum); there are manganese, diamonds, and the rare metals—wolfram, molybdenum and others. The Urals platinum is famous throughout the world and there are also asbestos, emeralds, jasper, malachite, mountain crystal, amethysts, and topazes. The drawback is that there is comparatively little coal and most of it is brown coal unsuited for iron and steel smelting. In this field again the intensive survey work of the geologists is gradually changing the picture.

The highest of the Urals mountains are in the north and south where some of the peaks reach 6,000 feet; in the central parts, around Sverdlovsk, you may cross the range without noticing it.

Metal ores, especially iron, take first place amongst the Urals minerals. Iron and steel smelting, therefore, plays a leading part in the Urals economy. The Urals is the oldest iron center in the USSR. The first iron mill was built here in 1631. The blast furnaces were built in wooded valleys on the banks of rivers

down which timber could be brought; they worked exclusively with charcoal. To a certain extent the old Urals iron region is analogous to that of Sweden.

The Urals was colonized by Russians, mostly from the north, who built the mines and mills. The Urals armed the Russian fighting forces. The arduous toil in those days was unbearable and frequent revolts broke out. In the eighteenth century the Urals provided the Pugachev insurrection with men, guns, and shot.

Serfdom was the basis of the prosperity of the old Urals and was also the cause of its decline. In the period of rapidly developing capitalism the remnants of serfdom prevented the Urals from growing and making technical progress. It was rapidly overtaken by the younger industrial regions of the south which grew up in the Donbas and at Krivoy Rog and where there was not only iron ore but also coal suitable for the manufacture of good coke.

When Soviet power was established there were over a hundred small and medium out of date mills in the Urals. Many of them were a long distance from the railway. There were blast furnaces that were still loaded by horses driven up ramps. Some of the old furnaces, with their cold air blast were two hundred years old.

URAL MOUNTAINS

Length of Chain: 1,200 miles.

Direction: Meridional.

Consists of parallel ridges from 2 to 10 in number.

Age: Highest date back to Carboniferous Age. Formation of the Urals was in general completed by the end of the Paleozoic.

This great age accounts for the considerable destruction.

Highest points: North Urals: Narodnaya 6,200 ft.

Tel-pos-iz 5,600 ft.

Sablya 5,500 ft.

South Urals: Yaman-Tau 5,400 ft.

Iremen 5,200 ft.

Central Urals is the most eroded and average heights are 1,000 to 1,500 ft.

The Urals water divide separates the Ob Basin in the east, the Volga Basin (Kama) and Pechora in the west, and Ural River in the south.

The Urals was given one of the leading places in the bigger works for the industrialization of the country, a place which it fully deserved on account of its exceptionally rich deposits of minerals and the skill of its hereditary craftsmen. The reconstruction project for the Urals was a very extensive one. The Urals became a big center with modern heavy industries: iron and steel, engineering, and chemicals. It became the chief link in the Ural-Kuznetsk Combine built up on Stalin's initiative. We learned something of the nature of the Urals-Kuznetsk combine earlier in this book: the Urals ores are found at a distance of 1,400 miles from the Kuznetsk coal in western Siberia. Trains carry ore from the Urals to Kuznetsk and coal from Kuznetsk to the Urals. At both ends of the railway there are huge mills producing iron, steel, and rolled goods.

Shortly before the outbreak of the Second World War the Karaganda coal field in Kazakhstan also began supplying coal to the Urals.

The result of the transformation of the Urals is that the majority of the mills now use coal. The present outcome is not to be compared with that of the old days. The Magnitogorsk Plant alone, with the help of Kuznetsk and Karaganda coke, smelts more iron than the whole of the old Urals.

Charcoal furnaces are still used in a few mills that specialize in high-grade steels.

The old copper refineries have been reconstructed and new ones built with modern equipment so that the Urals has become one of the chief copper producers in the USSR. Other non-ferrous and rare metals that are produced in the Urals are nickel, zinc, magnesium, aluminum, molybdenum, tungsten, chromium, vanadium, etc. Almost all the elements in Mendeleyev's

periodic table have been found in the Urals. Incidentally Mendeleev was a great Urals patriot. The majority of these elements have been found in quantities which make their working profitable. The reconstruction of the Urals is not confined to the mining industry and its tremendous increase. Formerly the Urals sent all its metal away and did not manufacture it on the spot. The Urals now has a huge engineering industry which manufactures machine tools, various metal structures for building, factory equipment, and automobiles.

New industries have appeared in the Urals. The forests which once upon a time only provided charcoal for the blast furnaces now provide raw material for pulp and paper mills. The only power resources in the old Urals were water-wheels and treadmills worked by horses. There is now a big system of electric power stations which are connected up into a grid covering the whole Urals; the mountain rivers of the Urals are being surveyed for the construction of hydro-electric power stations.

The role played by the Urals in the country's industries greatly increased during the war. After the Germans captured the Donetz Basin the Urals became the arsenal of the country, a huge forge that supplied the Red Army with weapons, machines and munitions. Throughout the war years building continued in the Urals. In addition to new factories of its own, the Urals had to provide sites for a large number of important enterprises that were evacuated from the western and southwestern regions of the USSR. Whole factories, laboratories, and institutes were evacuated to the Urals *in toto*. The Urals, already a technically progressive region, became the center for new designs. The Academy of Sciences transferred a considerable section of its work to the Urals.

In peacetime the Urals provided an ever-growing quantity of metal for the country's economy, provided the collective farm villages with tractors and mineral fertilizers, the power stations with turbine generators and copper wire, the railways with rails and wagons; when war broke out the Urals began producing

tanks and aircraft, armorplates and guns, explosives and shells—the Urals provided the Red Army with its modern equipment.

VII. BASTIONS OF THE HINTERLAND

WE REACH the North Urals at the source of the Kama where we are still in dense forests. On the right bank of the river stands Usolye, one of the oldest Russian settlements in the Urals. The high wooden towers of the salt mines have been here almost since the time of Ivan the Terrible.

Not far away on the opposite bank of the river stands the Berezniki Chemical Combine, which was built after the Revolution. The combine is in itself a whole township of concrete and glass factory buildings and towers. The whistle of steam and the roar of machinery—coal is brought to the combine by an overhead railway; the wagons are then loaded with mineral fertilizers and various chemicals. The little town of Usolye has long since become part of the new Berezniki.

Somewhat further north is the town of Solikamsk (Kama Salt). Ever since the fifteenth century people have pumped salt solution out of the ground and evaporated it in this district. Solikamsk is now the world's largest mechanized mine producing the rosy-white potassium salt from which fertilizers are made. The deposit at Solikamsk is much greater than all the other known supplies in the world taken together. The railway has now been built as far as the salt mines. The timber from the rich Kama forests is used to make high-grade writing paper and newsprint—the Krasnovishersky Pulp and Paper Mill is a new Soviet institution.

South of Berezniki are the towns of Kizel and Gubakha—the chief coal centers of the Urals. Kizel coal will make coke when it is mixed with Kuznetsk coal and some of the Urals blast furnaces use this mixture.

South of Kizel the railway is electrified. The line wanders picturesquely along mountain sides and frequently dives into

short tunnels. At the station of Chusovaya the electric railway brings us to the river of that name.

The River Chosovaya is very picturesque. Tourists come up to Chusovaya Station by rail and then float downstream in canoes. The river flows through untouched primeval forests, between rocky banks, and over rapids. The troops of the Cossack Yermak, who added Siberia to the Russian Empire, advanced eastward down the Chusovaya in 1579.

One of the oldest of the Urals iron and steel plants stands at the point where the railway enters the Chusovaya Valley. A number of new blast furnaces have been added to the old ones, amongst them the world's largest charcoal burning furnace. Lower down the river we come to Chusovskaya Gorodki. In 1929, geologists were searching for the bounds of the Solikamsk potassium deposit and a well which was sunk quite unexpectedly touched oil. This was what gave them the start in the search for an oil zone between the Urals and the Volga.

West of the Chusovaya Valley is the town of Molotov (formerly Perm), on the Kama, where there are a dozen important engineering plants. The town stands on a high plateau overlooking the Kama and spreads for a considerable distance. Between the town and the river, at both ends of the residential section there are huge factories. From the high bank, the river and the opposite shores are visible over a long distance; opposite Molotov, the forest has been cleared and extensive plowed fields take its place; beneath our feet, on the terraced slopes of the high bank, there are more smoking factory chimneys and a branch railway line serving the factories.

At the new town of Krasnokamsk, some distance downstream from Molotov, there are now important paper making and oil industries. Around Molotov there is a very extensive farming region which supplies the North Urals with bread and potatoes.

Going eastwards from Chusovskaya, across the mountain range, the railway turns north where the town of Serov, with its important iron and steel industry lies amidst dense forests. Formerly Serov (then known as Nadezhdinsk) was the railhead and

beyond was nothing but virgin forest. Man has now penetrated into the depths of those forests to get at the mineral riches that lie buried in the Urals. At Karpinsk coal is mined. During the war the biggest deposit of bauxite yet found in the USSR, the Red Cap Mines, were started going. The mines are hidden in deep valleys with steep densely wooded sides. Nearby is one of the highest points in the North Urals, the Denezhkin Stone. The raw materials obtained from the Red Cap Mine supply the Bogoslovsk Aluminum Plant. This plant began turning out aluminum at the beginning of 1945. A heat and power generating station was built to supply current for the electrolysis vats. Fuel for the plant comes from the two big open cut mines at Volchansk where the coal is loaded straight from the quarries into the railway wagons. A railway line was also built from Serov to Bogoslovsk.

We have made a trip from Chusovskaya westward to Molotov and northeast to Serov; now we will take the electric railway to the south, or rather to the southeast in the direction of Sverdlovsk, the metropolis of the Urals.

The valleys become wider, there are greater numbers of deciduous trees in the forests and there are many gaps where the forests have been cleared. The signs of industry visible in the landscape become more and more frequent—the smoke of factory chimneys rises over the forests and pylons carrying high-voltage transmission wires run through alleys cut in the woods.

The nearer we get to Sverdlovsk, the greater the old Urals is hidden behind the modern industrial buildings. In the Central Urals there are many towns—Krasnouralsk, Pyshma, Lower Tagil, Upper Salda, Kirovgrad. The plants in these towns refine copper, roll tubing and make all kinds of machines.

At Lower Tagil amongst other plants there is a huge iron and steel mill. Tagil has changed completely. The little old iron and steel mill is lost to sight amongst the new industrial buildings that stretch along a territory three-quarters of a mile in length. The center of Tagil is typical of the old Urals towns. The nucleus was a factory standing on a small river that had been

damned to provide current for the water-wheel which was once the only source of power. The town grew up around the mill-pond; its best buildings were the factory offices, the director's house, and those of the leading engineers and the merchants. In Tagil today there are whole blocks of new apartment houses and many new factories. All that remains of the old town is the pond with an excellent park on its banks.

VIII. THE CAPITAL OF THE URALS

SVERDLOVSK, the biggest Urals town, stands in the middle of a big industrial "black country"; before the war the population reached almost half a million.

Sverdlovsk is on the eastern slopes of the lowest part of the Urals amidst extensive pine woods. Seven railways cross at this point. The town occupies a tremendous area. Its general appearance is typical of the towns that have been built mainly during the past few years—large number of huge new buildings that tower up amongst a veritable ocean of small one and two-storey wooden houses. The town has spread to such an extent that it long ago enveloped the old Upper Isetsk Factory which before the revolution was several miles from the town. The factory with the pond that accompanies every old Urals plant, is now inside the city. This is the third pond formed by the Iset River that is within the city bounds. There are bridges across these ponds and a lot of greenery on their banks. The extent of the new building operations is to be seen in the way in which the city is planned—there are extensive areas left for the industrial concerns, wide streets and boulevards and big open squares. Much of this plan has already been carried out. In the district where the higher educational establishments are to be found there is a whole students' community with big hostels for the students and houses for the staffs. The town contains a large number of workers' clubs and several fine hotels. The new theaters outdo the fine old opera house that was built by the mine-workers.

Even before the Revolution Sverdlovsk was, in its own way, a busy center—this was the place where the Urals mine-owners, merchants, and speculators made their gigantic fortunes and this is where they had their homes. The business men and engineers, the gold field owners, and the iron and steel syndicates, all gathered around the administrative offices of the Urals Mountain Region. Amongst the relics of this time that still remain in Sverdlovsk, there are many excellent private houses; even at that time there were scientific and technical societies in Sverdlovsk and a museum with a fine collection of minerals; today these have grown beyond recognition. Today in Sverdlovsk there is an Affiliate of the Academy of Sciences, about thirty research institutes, and well-equipped magnetic and meteorological observatories.

Ekaterinburg, as Sverdlovsk was called before the Revolution, was famous for its lapidaries workshops where all sorts of precious stones were cut and polished and knick-knacks for the palaces of St. Petersburg were made from Urals semi-precious stones. There was a gold assaying laboratory in the town where the gold miners brought their dust and nuggets. There were a number of other minor industrial concerns. The new Sverdlovsk is a first-class industrial center. The Uralmash Works, built in Soviet times, is known locally as the "factory of factories" for it produces machinery for the iron and steel and other industries in such quantities and in such variety that its output can be used to equip fully a large number of other plants. The machine tools from Uralmash are amongst the best in the world. There are a dozen other big engineering plants all in Sverdlovsk, the majority of which have been built quite recently.

IX. THE SOUTHERN URALS

FROM Sverdlovsk our journey takes us farther to the south. The conifer forests become thinner and soon we run into the beginning of a wooded steppe region. We by-pass Ufalety, where

the first nickel was smelted in the USSR during the period of the pre-war Five-Year Plans, Kasli, where some very artistic work in cast iron is done and then Kyshtym, where copper is refined, until the train reaches Chelyabinsk, a city lying in the plains on the Siberian side of the Urals. The landscape around the city is dotted with pine and birch groves with a number of small lakes sparkling between them.

Chelyabinsk is the living example of present-day Urals. It was formerly a small provincial town that was mostly famous or notorious as the transfer point where peasants colonizing Siberia were collected. The colonists spent long periods in the huge barracks at Chelyabinsk awaiting orders to continue their journey. The barracks were notorious for their terrible sanitary conditions and the high mortality rate amongst their inhabitants.

Modern Chelyabinsk is a huge industrial center which rivals Sverdlovsk. The new industry established here became the mainstay of the collective farms of Siberia and other regions of the USSR: the world's biggest plant producing caterpillar tractors was opened here in 1933. The plant later began to turn out tractors with Diesel engines. Other new plants were an electro-metallurgical plant producing ferrous alloys, a zinc plant using the by-products of the Urals copper refineries, a big machine-tool plant, and a big power station. Brown coal is obtained in the Chelyabinsk region. Before the war an important iron and steel mill was started near Chelyabinsk, which used Kuznetsk coke to turn the Bakal iron into high-grade steel which is considered amongst the best in the world.

The favorable geographical position which Chelyabinsk occupies goes a long way toward ensuring its development as an industrial center: there is a junction of railroads, the country is flat plain, there is coal available.

The town has spread in all directions, each of the factories on the outskirts has developed its own housing estate and these estates are all of different styles as they were built at various times. Some of the housing sections consist of tiny cottages, there

re monotonous rows of apartment houses that look like boxes of bricks—a reminder of the first period of economic development in the USSR when every spare ruble was used to build factories, and there are also the newest estates of well-built beautiful and comfortable houses, that belong to the pre-war period of socialist prosperity. The factories and their estates stretch in a long line along the river Miass. In the center of the big town public buildings have taken the place of the derelict old wooden houses.

To the east of Chelyabinsk stretches an open plain where state and collective farms grow wheat and maintain herds of cattle that provide excellent meat. The Chelyabinsk Region is more southerly than Sverdlovsk and its agriculture is more highly developed.

West and southwest of Chelyabinsk lie the high, wooded, South Urals Mountains with their many mines and factories. Not far from the town, where the Chelyabinsk-Kuibyshev Railway crosses the mountains, is the post that marks the border between Europe and Asia. On the western slopes below the pass that crosses the wooded Kosotur Mountain, lies the town of Zlatoust beside another of those big factory ponds; this was once the home of the famous Urals sword blades and is now a producer of high-grade metals. At the eastern end of the pass is the famous Ilmen Geological Preserve where over 150 different minerals have been discovered. Geologists from all over the world visit this natural treasure house. The Urals Automobile Plant, built during the war is not far from Chelyabinsk.

X. THE MAGNETIC MOUNTAIN

IF WE continue our journey further south by train we shall spend a long time crossing arid steppelands. The horizon is formed by the humps of those long low hills known as "hogsbacks." At last we come to Magnitogorsk, the pride of the Urals and one of the biggest iron and steel mills in the whole world.

We come within sight of Magnitogorsk quite suddenly—a

breath-taking panorama of gigantic black blast furnaces, high chimneys, clouds of black smoke, weird metal structures, concrete buildings of enormous size, the streets of a new city with trams and autos, and lastly, the famous mountain itself that is so rich in magnetic ore.

Magnitogorsk was amongst the first big construction jobs undertaken in the USSR. Like a favorite first child it filled the minds of the whole country. The town was built at amazing speed in an uninhabited desert where it is extremely hot in summer and suffers severe frosts in winter.

The country waited impatiently for the metal from Magnitogorsk and the plant started work when most of the workers were still living in hutments and self-made dugouts. Step by step, housing estates of various kinds grew up out of the chaos surrounding the mills, mines, and the power station that was then still under construction; soon the estates joined up and began to look like a town. Block by block apartment houses were built, wide straight roads took the place of the hastily made paths, the park that had been laid out grew rapidly.

A dam across the Ural River formed a big lake which provides water for the power station, the blast furnaces, as well as for many other purposes.

The town, lake, and factory are surrounded by low, bare hills in the midst of which the comparatively low Magnitnaya Mountain (2,000 feet) which is in reality a small group of hills. The Magnet Mountain contains millions of tons of iron ore. The sides of the mountain have been cut into enormous terraces where excavators load the reddish-brown lumps of magnetic ore into the trains direct from the open quarries. From there the ore passes through the crushing and concentrating mills. Batteries of coke ovens convert coal brought from Kuznetsk and Karaganda. The huge blast furnaces with the water-pipes curling round them, furnaces that stand as high as a ten-storey house, smelt the ore and the glowing liquid metal is poured from the furnaces straight into huge ladles that run on rails. Open-hearth furnaces turn the pig iron into steel, the blooming mills draw

out the ingots, and the rolling mills turn them into rails, girders, sheets and whatever else is needed.

The railway which takes us south to Chkalov (formerly Orenburg) was built in Soviet times. Chka'ov is the center of a region of the same name, which forms the lower or southern end of the Urals. The mountain range dies away gradually in a series of low-lying bare hills. This was formerly a region of very poor farms that suffered from frequent droughts. The collective farms with their abundant machinery are now conducting a successful battle against the drought. There are also a number of big state farms, some growing grain, others being chiefly big cattle ranches. These farms are gradually putting the dry steppe under the plow.

The new factories that have been built in the Chkalov Region make it the last link in the Urals industrial chain. The big industrial concerns are: iron and steel, oil refining, meat processing; they are found mostly in the eastern corner of the province in the vicinity of the town of Orsk.

At Buguruslan, in the northwestern corner of the Chkalov Region, oil and combustible gases are now obtained. The oil fields also extend farther to the north and join up with those of the Bashkir Autonomous Republic which lies to the west of the Urals (Ishimbai, Tuimaza). This is the edge of that same "Second Baku" which we visited earlier on.

Bashkiria is divided into two parts—the wooded highlands of the east (where there is an old but completely reconstructed wire drawing mill at Belorechye) and the steppe zone of the west which is mainly agricultural. The town of Ufa, capital of the Bashkir Republic, has a picturesque location on the Belaya River; in Soviet times it has become an industrial town with engineering, timber, and oil refining plants. It is the cultural center of Bashkiria.

Bashkiria has many excellent pasture-lands, there are groves of fine old linden trees, big karst-hole caves and a mysterious "burning mountain."

6. THE OASES, DESERTS AND TOWNS OF CENTRAL ASIA

I. THE THRESHOLD OF ASIA

NOW THAT WE HAVE TURNED southward we can continue directly to the southernmost regions of the USSR, the Central Asian republics of Uzbekistan, Turkmenia, Tajikistan, Kirghizia, and Kazakhstan.

How big are these republics? Kazakhstan is as big as the Argentine, Turkmenia is as big as Ecuador and has only half its population, Uzbekistan is about as big as Sweden and has a population about as big as that of Greece or Portugal. Tajikistan is only a little smaller than Uruguay while Kirghizia is equal to New Zealand in area and population. We are going to visit a number of states, five big republics out of the sixteen that constitute the Soviet Union.

The Tashkent express from Moscow crosses the Volga two days after it leaves the capital. We cross that seemingly endless bridge at Syzran under which we passed once before when we were on our way to the Caucasus.

After Kuibyshev the landscape becomes monotonous: the pleasant variety of the Central Russian landscape with its fields, groves, and villages has gone. The open steppe stretches for hundreds of miles and is swept by the hot dry winds of the south.

The boundary between Europe and Asia at this point is the Ural River which flows into the Caspian. We saw the upper

reaches of this river at Magnitogorsk when a small dam served to form a lake; where the southern express crosses it, it is a wide navigable river.

Soon after crossing the river we enter the wide open spaces of the Kazakh S.S.R., which is the biggest Soviet republic in area with the exception of the R.S.F.S.R. It stretches from the mouth of the Volga to Mongolia, from the Urals to the Tien-Shan.

A great dry plain—the bare humps of low hills—almost complete absence of trees—such is the general aspect of the majestic, stern, and endless steppe.

In spring the steppes are fresh green studded with countless flowers, but this season is short lived. The grass grows high and stretches as far as the eye can see, the wind plays over it stirring it into waves like a restless ocean. Then comes the hot summer when the main tone is brown. The dry grass rustles harshly in the wind, the burning sun blazes in a cloudless sky. In the trembling, overheated atmosphere the horizon sometimes lifts and shows us a non-existent river.

In winter the steppes are a dazzling white plain and the frosty wind drives before it the dry powdery snow mixed with dust.

The pastures of Kazakhstan have grasses of different fodder value and flourish at different times of the year; these variations in cattle feed cover a country that is as big as half of Western Europe and determine the nature of the animal husbandry that is still the chief branch of the republic's national economy.

Huge herds of cattle are driven from place to place in Kazakhstan in order to make the most profitable use of the pastures. In the winter they feed on the grass of the lowlands where there is little snow and of the water meadows along the rivers; in summer the cattle drive takes them either north to fresh steppes or south to the alpine pastures in the mountains.

The Kazakh people were nomads for centuries, and sometimes traveled 500 or 600 miles a year with their herds. The wisdom and experience of the common people enabled them to

develop a clever system of changing pastures from season to season, but the nomad life was a heavy burden on them.

In heat and in cold the Kazakhs lived in their yurts—beehive-shaped felt tents stretched over a wooden frame; there was a hole at the top to let out the smoke from the fire of dried dung that burned on the ground in the center of the tent. When there were heavy frosts a crust of ice covered the steppes, under which the animals could see but not reach the grass—the hoofs of the horses were cracked and bled from their efforts to break through the ice and the sheep chewed each other's wool.

Modern Kazakhstan still makes use of the valuable experience of past generations. The cattle drives from one season's pasture to another still take place but the animals are tended only by a brigade of herdsmen from the collective farm and not by the whole tribe. The majority of the population live in regular settlements with houses, schools, and medical institutions.

The rich collective farms own their own automobiles. In the event of a bad winter there are reserve stocks of hay, silage, and root crops. Proper housing is provided for the young cattle in winter.

The nomad system of animal husbandry makes it possible to use to the greatest advantage all the vast pasture lands of Kazakhstan. Considerable work is being done to improve the quality of the cattle.

Formerly the nomads hardly ever saw bread or flour and knew nothing at all of vegetables. Today there are corn fields and vegetable gardens around all the settlements; there are no purely stockbreeding regions left in the whole republic.

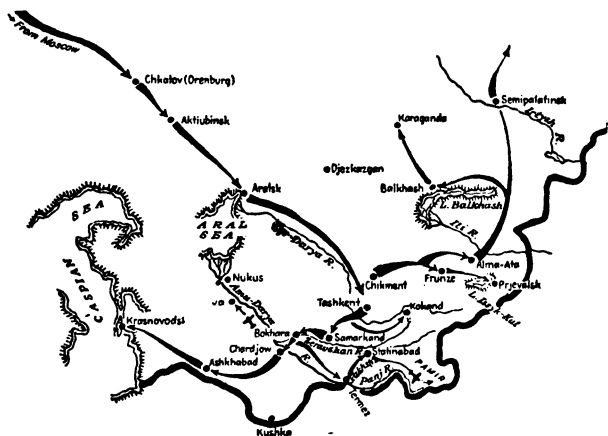
The nomads of Kazakhstan have settled in villages, the primitive cattle-breeding of the past is supplemented by agriculture, but this is not all—industry has come to the steppes. This we see at an early stage of our journey.

Near Aktiubinsk, a dusty town of whitewashed earthen houses, there is a big chemical works which produces more phosphorite fertilizers than all tsarist Russia produced. Near

the works there are gardens with broad-leaved trees, a patch of brilliant green against a background of the gray steppe overgrown with wormwood.

The phosphorites of Aktiubinsk are the first of Kazakhstan's mineral treasures that we meet with but soon we shall see many more of them.

Western Kazakhstan is becoming an important industrial



area. The plants that were built during the war to produce ferrochrome from the chromium and nickel deposits lie just beyond Aktiubinsk. Potassium has been discovered; a railway has been laid to the growing Emba oil field at the northeast corner of the Caspian, and borium has been discovered and is being worked at Lake Inder.

The railway crosses the low Mugojari Hills, the southern most spur of the Urals and approaches the Aral Sea. The Aral is a salt lake that is fourth in the world in size and which, like the Caspian, is called a sea on account of its salinity, the nature of its fauna, its color, and its general behavior. It has a beach of yellow sands beyond which is the greenish-blue water of the sea: there is a fishing industry and salt is obtained.

The area of the Aral Sea has been decreasing during "recent" eras as can be seen from the large areas of naturally deposited salt which is simply picked up with a shovel.

KAZAKH S.S.R.

Area: over 1,000,000 sq. m.

Population: 6,150,000 (1939), Kazakhs and Russians predominate, but there are Kirghiz, Ukrainians, Tunkans (or Dungan, a Chinese type who are Mohammedans), Uzbeks, Koreans, Tatars, and others.

Neighbors: Northwest, north and northeast—R.S.F.S.R.; south—Turkmenia, Uzbekistan, Kirghizia, and China (Sinkiang).

Relief: Mostly plains; south and southeast fringed by wall of high mountains (Tien-Shan, Jungar Ala Tau, and Altai), rising to 23,000 feet (mount Khan Tengri at the point Kazakhstan, Kirghizia, and China meet); central regions form "Kazakh fold" where highest point is 4850 feet. Between the Aral and the Caspian is deepest dry depression in USSR—Baty (Karagiz) which reaches 436 feet below sea level.

Chief Rivers: Syr Darya (1,800 sq. m.), Irtysh, Ural, Ili, Chu, Ishim.

Chief Lakes: Caspian (See page 109), Aral Sea 24,000 sq. m., Lake Balkhash (6,600 sq. m.), Nor Zaisan (700 sq. m.).

Part of Russia since middle of 18th century. (Northern and eastern parts), remainder since middle 19th century.

Soviet Power established 1917–18, finally victorious 1920.

Produce: Copper, complex ores, gold, iron ore, coal, oil, wool, meat, grain, cotton, fruit, fish.

Capital: Alma Ata.

Near the Aral Sea, where the rainfall is less than a quarter of that of Moscow, there is a Desert Experimental Station. In deep trenches that reach almost to the subsoil waters the station grows melons, potatoes, tomatoes, and cucumbers.

The station of Aralsk is the starting point for the Aral Sea steamers. The railway passes close to the mouth of the Syr Darya, one of the two big rivers that cross Central Asia and fall

into the Aral Sea. The mouth of the river splits into several sleeves that are overgrown with reeds, willows, alders, and other water-loving plants. There is the town of Kazalinsk near the mouth of the river, an old settlement, and about fifteen miles from it, around the railway station there is New Kazalinsk.

The train continues its way southeast along the right bank of Syr Darya. In the numerous backwaters and islands in the flood lands of the river rice is sown; there are endless jungles of reeds that give cover to wild bear and game birds. Beyond the flood lands, there is a dry open plain where herds of sheep and camels graze, sand dunes and patches of salt are frequent.

The Syr Darya carries sufficient water to irrigate a large area; it was this abundance of water that prevented its being harnessed in the past. The floods washed away the simple dams that were built and with them whole villages. Thus arose the paradox of the most deserted part of the desert being that which was closest to the life-giving water. All life lay beyond the high-water mark.

With economy in the hands of the state matters are different. Before the war work was begun on a big dam at Kzyl Orda. The difficulties of the first years of the war prevented its completion but later the work was continued. The land that will be irrigated when the dam is completed will mostly be used to plant rice.

Our train has passed Kzyl Orda and we have now reached the Arys Junction where the famous Turksib Railway begins; this line runs through southern and eastern Kazakhstan (which we shall visit later). To the south we can already see the bluish outlines of spurs of the Tien-Shan—here we cross the border between the Kazakh and Uzbek Soviet Socialist Republics.

II. THE CITY OF PYRAMIDAL POPLARS

THE Uzbek Republic lies in the very heart of Central Asia. It is the leading Central Asian Republic from the standpoint of

population and economy. The republic consists of alternating dry deserts and flourishing oases; most of the population is concentrated in the oases. All life is where there is water. For thousands of years here the fields have been artificially irrigated by canals; the water is distributed around the fields by narrow channels called *ariq*. The water for irrigation is most easily obtained in the foothills of the mountains where the rivers run down a considerable slope. All the bigger oases lie near the mountains with the exception of the Oasis of Khwarizm which is on the upper reaches of the Amu Darya far from mountains.

The Uzbek Republic has more irrigated lands than all the other Central Asian republics taken together. Agriculture is very specialized—cotton, fruits, silk, and a few other southern crops. Sheep-breeding is well developed.

In the north of Uzbekistan, where the railway comes from Moscow through the Kazakh steppes, is Tashkent, the capital and biggest city of the republic. In 1939, at the time of the last census Tashkent came eighth on the list of Soviet cities arranged according to population. At that time there were about 600,000 inhabitants but today there are a great many more. Tashkent lies at the edge of the plain right close to the foothills (520 feet above sea level); it is the center of an extensive oasis that is watered by canals fed by the Chirchik, a right tributary of the Syr Darya. The *ariq* or secondary canals carry the water all over the city. The *ariqs* run down both sides of every street between the road and the two sidewalks; branch *ariqs* carry the water into the compounds of the houses. The *ariqs* provide water for all the vegetation in which Tashkent is so rich; there is everything from tall stately poplars to roadside grass patches.

The summer in this part of the world is almost rainless, cloudless, and terribly hot but owing to the dry atmosphere the heat is easily bearable. The nights are cool. The best time of the year is autumn. The winter is rainy, the frosts are light, and do not last long. In general the climate of Tashkent is that of the whole Central Asian plain. In the southern part of Uzbeki-

stan the winters are warmer and the summers slightly hotter.

The area covered by Tashkent is unusually big—bigger than Moscow, for example. The buildings seem to float on a sea of green. The streets are lined with poplars, lindens, and the heavy black beeches with their spherical crowns that offer excellent shade. With the exception of the center of the city, the streets are built up with small, cosy houses, almost each one of which stands in its own garden. The environs of the city are given over entirely to orchards. The water in the *ariqs* bubbles merrily down the streets. On the horizon we see the Chingan Mountains that are almost always covered with snow; the source of the Chirchik, the bringer of life to the whole oasis is in these mountains.

Formerly, Tashkent was two sharply defined towns—Old and New Tashkent. The old town is a chaos of narrow winding alleys between the windowless earthen walls of the Uzbek houses; their windows face the courtyard where there is plenty of greenery and usually a little pond (the *hauz*), whose waters are kept fresh by the *ariq*. At the street crossings there are little tea houses—the *Chai-khana*—where we may sit on a carpet and get a refreshing drink of *kuk-chai* or green tea, the Uzbek's favorite beverage. It sometimes is possible to find one's way in the old town by using the mosques as guides. The mosques are to be found on the wider streets that are always packed full of people, tiny eastern donkeys and *arbas*, small carts on two wheels more than a man's height in diameter; the drivers of those carts sit on the horse or on the shafts; the wider streets lead to the bazaar where we see much that is truly oriental—alongside fruits, vegetables, and other food products there are booths in which are sold old carpets, bright national embroidery, the long native jackets, and embroidered skull caps.

The new town was built entirely after the region was incorporated in the Russian Empire, that is about eighty years ago. The wide, straight streets, the abundance of greenery, and the architecture are a compromise between the usual Russian town-

planning methods and the local climatic conditions; the majority of the houses are small and have windows facing the street, but the rooms are deep so that the sun does not reach even half way across them. Shady verandas open out on to the gardens. The new town was built for Russian officials, officers, and administrators. It, however, grew far beyond what was originally planned and soon became the capital of all Central Asia and attracted a number of business men. A local Russian intelligentsia grew up in Tashkent and, finally, rich Uzbeks built themselves houses there. The new town soon enveloped the old, the huge poplar trees looked a century old after ten or fifteen years growth in that generous climate and before very long the city of Tashkent had the appearance of an old habitation of man.

In present-day Tashkent both the old and the new have changed very considerably. Many big buildings have been added to the new town, a whole town of dwelling houses for the textile workers has come into existence, an opera house has been built, and the main streets have been asphalted. The new town is now inhabited by both Uzbeks and Russians. In the old town there are also asphalted streets, big buildings of modern architecture being built and for the first time a water main has been laid on there. The reconstruction of the old town is a surgical operation—the tiny alleyways cannot possibly be straightened or widened into streets suitable for modern traffic and so a line has to be drawn to mark a new street and the old mud huts that are joined into solid masses by mud walls are simply being cleared away. The new roads that have been made in this way are planted with trees, trams run along them, and on both sides fine new buildings have sprung up; the architecture of the buildings is a synthesis of the best that has been produced by the east and the west. An excellent new theater was built in the old town during the war years.

In summer the early morning is the best time. The town awakes refreshed after the previous day's heat. The greenery is

especially fresh in the mornings. It is pleasant to drink tea on the open veranda and then go out into the streets that are already busy before the day's heat sets in. Peasants from the suburban farms come into town with two pails on a yoke, one of them containing fresh milk, the other sour milk; they walk along the streets calling out their wares. In the bazaar there are colorful heaps of fruit and vegetables, and large quantities of flowers. All summer long there is an abundance of fruit. In May there are strawberries, in June apricots, in July peaches, in August grapes, melons, and cantaloupes. The housewife also has her vegetables, fresh all the time from April to October—tomatoes and radishes, egg plant and green onions, sweet peppers and beets. In winter additions to the market are sweet raisins, various kinds of dried fruit including the amber-colored strips of dried melon and mountains of nuts.

At midday the asphalt and the bricks of the sidewalks are exceedingly hot and in order to cool them the people take buckets and with a few wide sweeps drench them with water from the *ariqs*.

There was no big industry of any sort in pre-revolutionary Uzbekistan. Today industry accounts for over half the output of the national economy of the republic; during the war the share which falls to heavy industry increased from 14 to 50 per cent of the whole. This is not much like pre-revolutionary Uzbekistan, the backward colony of illiterate farmers who used wooden plows!

In Tashkent there is a tremendous textile combine—spinning, weaving, printing, and dying—which turns out tens of millions of yards of cloth a year.

The growth of the cotton-growing industry made the building of an agricultural machinery plant a necessity. The Tashkent plant turns out the most up-to-date machines for cotton fields. Other engineering plants were built in Tashkent during the war. The warm, dry climate of Uzbekistan made it an ideal place for some of the plants that were evacuated from the west. The

machine-tools were erected and production immediately began in the open; in the meantime the walls and roofs were built around the machine shops.

There is a big electric power station on the Chirchik River near Tashkent. It provides power for a big chemical plant which produces nitrogen fertilizers. Nearby is the completely new town of Chirchik. To reach Chirchik we take a train on the suburban railway which passes all the way through orchards irrigated by the Boz-Su Canal; the Boz-Su is an ancient canal that has watered the Tashkent Oasis for centuries. It takes the water from the Chirchik River.

At Almalyk in the valley of the Angren River, not very far from Tashkent, Soviet geologists have discovered important deposits of copper. Mines and a refinery were therefore opened to deal with the deposits. Coal has also been found in the same valley; the mines started working during the war. The coal is of great importance as formerly the republic used coal that was hauled over long distances.

Tashkent is the most important cultural center of Central Asia. A large number of the Central Asian higher educational institutions, opened since the Revolution, are to be found in Tashkent. These colleges train irrigation engineers, agronomists, teachers, doctors, and other specialists. An Uzbek Academy of Sciences has been founded, many books are published in the Uzbek and Russian languages, in Tashkent there are excellent Uzbek and Russian Theaters. One of the stars of the Tashkent Opera, Halima Nasyrova, is amongst the foremost singers of the USSR. She often gives concerts in Moscow and other cities of the Soviet Union.

The streets of Tashkent are colorful and animated. Automobiles frighten the important-looking camels. The trams screech as they turn the corners. On the shady side of the street there are crowds of pedestrians. You will see white suits and costumes of European cut, and the skull caps and long striped robes of the peasants. There is a babble of different tongues. Russian and

Uzbek girls wear gaily colored dresses and embroidered skull caps. Unmarried Uzbek girls often wear their black hair in countless number of tiny braids. On rare occasions one may still meet a relic of the past—a woman veiled from head to foot and her face covered with a net of black horsehair. In pre-revolutionary Uzbekistan the woman was a chattel. She was not allowed to go on the streets with her face uncovered. Today, like all women in the USSR, she has full rights in everything. The sale of brides is forbidden by law and has already ceased to exist as a custom, child marriage and polygamy are also forbidden. For the first time in history the Uzbek woman has become a teacher, actress, doctor. Many women were elected to the Supreme Soviet of the Republic where they take part in governing the state.

III. WATER AND LIFE

FROM the Oasis of Tashkent the Railway runs southwest.

UZBEK S.S.R.

Area—160,000 sq. miles.

Population: 6,300,000 (census of 1939). Majority Uzbeks; many Russians, Kara-Kalpakians and Tajiks; also some Kirghiz, Turkmenians, Bukhara Jews, Arabs, and Kazakhs.

Neighbors: North—Kazakh S.S.R.; west and south—Turkmenian S.S.R.; south—Afghanistan; east and south—Tajik S.S.R., east—Kirghizia.

Relief: Plain running into mountains in the east. Highest point 16,500 feet. Several large deep valleys in the mountains, most important being Ferghana (120 miles long, 60 miles wide.)

Chief Rivers: Syr Darya 1,800 miles, Amu Darya 1,590 miles, Zeravshan, Kashka Darya.

District of Russia since 1856–76 (except Bukhara and Khiva which were nominally independent).

Soviet power established in some districts 1917. Finally victorious 1920. Bukhara and Khiva formed People's Republics and

finally adopted Soviet power in 1923–24, in 1925 Uzbek Republic formed.

National Autonomy: in Uzbekistan: Kara-Kalpak A.S.S.R. (center Nukus).

Chief Produce: cotton, fruits, and Southern farm produce, complex metal ores, copper, sulphur, coal, oil, rare metals, hydroelectric power.

Capital: Tashkent.

On our right is the irrigation system that has been built in the Hungry Steppe. In this waterless region whose very name tells of its poverty Russian engineers began irrigation work in the last century, cutting big canals from the Syr Darya. The work developed slowly and produced modest new irrigated areas. Under Soviet power the old system was greatly improved and the irrigated area considerably extended. The canals form straight lines at regular intervals and bear no resemblance to the tangle of *ariqs* which once formed the only irrigation system in Central Asia. The new settlements are built along straight tree-lined streets. The irrigated area is aptly called *Pakhta Aral*—the Cotton Island. It is a real green island, a new oasis in a sea of grayish-yellow stand.

Suddenly we are astonished to learn that part of the irrigated section of the Hungry Steppe is not Uzbekistan but Kazakhstan. We left Kazakhstan for Tashkent, have not turned back and yet we come again to Kazakhstan. What winding frontiers for countries to have! This, incidentally, is typical of the Central Asia Republics and we shall see it several times more in our travels. This intricately winding borderline is due to the historical past of the country. In the course of past centuries many nomadic peoples invaded the flourishing valleys between the high mountains. They settled around the oases, mingled with the cultivators who have always kept close to the water. Between the mountains tribes and then nations, principalities and khanates were formed. Many of them disappeared leaving behind no traces but some remained as part of the fantastic national pal-

tern that is Central Asia. The Soviet government gave the peoples of Central Asia the opportunity of delineating boundaries in accordance with living ethnic principles, dividing the Uzbeks, Tajiks, Turkmenians, Kirghiz, and Kazakhs in accordance with the territory they actually inhabit. The mixture of peoples in the mountain valleys was reflected on the map.

In addition to this, in delineating the boundaries the sources of water supply had to be taken into consideration. Fields cultivated by Uzbeks, for example, could not be separated from mountains which for centuries had provided them with water. The frontiers, therefore, not only follow the regions in which different nations live but also run along the mountain water divides. This observance of national interests is one of the reasons why national enmity has disappeared in Central Asia.

From the Hungry Steppe the train turns south into the interior of Uzbekistan. We pass the point where the full-watered and noisy Syr Darya enters the plain from the Mogol Tau Mountains; the Farhad Hydro-Electric Power Station was begun at this point in 1943, and is now nearing completion. This will be the "Uzbek Dnieper" and will supply current for the industries of the Tashkent Oasis. The dam will impound water to irrigate fresh lands.

The name of the power station has an interesting origin. The Uzbeks have an ancient poetic legend which every peasant knows. It is the story of a good-natured but capricious princess whose castle stood on the cliff about the place where the power station is now being built. The princess agreed to give her hand to the one of her many suitors who would perform a great deed: in sympathy with the poor people who were in dire need of water, she announced the irrigation of the steppes was the deed that would win her. One cunning young nobleman ordered the steppes to be covered with mats of chi grass so that when the sun rose the princess thought it was water and agreed to marry the "hero." In the meantime a simple hero of the people named Farhad had brought water to the steppes by his honest toil.

Great streams of water flowed from the mountains down into the plains. The sun changed its course, the mats no longer glistened and the trick was discovered. It was too late, however, for Farhad, learning of the victory of his rival threw his heavy *ketmen* (hoe-like spade) up into the air which fell on him and split his skull open. In Soviet times an opera was written on the theme of this legend and is now splendidly produced in the repertoire of the Tashkent Opera House. The name of Farhad, the popular hero and water-bringer, has been given to the power station that is being built on the Syr Darya. In our own days the people have accomplished deeds that were prophesied by the poets of old. Not far from Farhad is the first Uzbek iron and steel mill which was built and opened during the war.

At the station of Ursatievskaya, the railway divides into two branches, one going east to the Ferghana Oasis—one of the most important oases in the whole of Central Asia—and the other branch to the oasis of the Zeravshan River. We will go eastward to Ferghana. To reach Ferghana we shall have to cross a narrow strip of the Tajik S.S.R. and the town of Leninabad—another example of the zigzag boundaries of the Central Asian Republics.

Sun-cracked earth, scanty growth of wormwood, gray tones—then, suddenly, the desert ends as though cut off with a knife: the train enters a bright green oasis.

Here there are water and shade. Along the bubbling *ariqs* are rows of pyramidal poplars and mulberry trees. Isolated black beeches are to be found near the railway; their thick leaves look like balls. The fields are sown to cotton and alfalfa. In paddy fields surrounded by low earthen walls there are plantations of rice. In the villages—*kishlaqs* they are called in Central Asia—there are vineyards and orchards surrounded by the same low walls. On the slopes of the mountains, where there is a bigger rainfall and the temperature is not so high, wheat is grown.

The Ferghana Valley is surrounded by a ring of mountains

that are broken by a narrow pass leading to the west. This region has one of the densest populations in the whole of the USSR. The *kishlaqs* form an almost continuous chain, a sort of inner circle in the foothills. The valley is exceptionally fertile: it enjoys abundant sunshine, is sheltered from the wind and is well-watered by a dense network of *ariqs*. The cotton harvests are very high. Alfalfa, a nitrogen-fixing plant, is sown to restore the soil; it grows so profusely that it may be mown five times a year. The fruits of Ferghana have a very high sugar content.

The upper reaches of the Syr Darya, a very full river, flow through the Ferghana Valley but until recently this river was not used for irrigation purposes; the Ferghana canals were fed by comparatively small rivers flowing from the near-by mountains and which were used entirely for irrigation purposes. In plan each of these river-canal systems looked like the skeleton of a leaf: the main stem split into a number of veins from each of which hundreds of tiny arteries again branched off until the water which they carried disappeared into the ground they irrigated. A considerable part of the valley, however, was not watered and remained desert. In the years 1939-40 the collective farmers on their own initiative and in an incredibly short time dug the Stalin Great Ferghana Canal, one of the biggest irrigation works in the USSR. The first section of the canal was about 170 miles long and was completed in six weeks. About 160,000 people took part in the work which gave rise to unexampled enthusiasm. The canal takes its water from the headwaters of the Syr Darya (or rather from the Naryn which joins with the Kara Darya to form the Syr Darya) and stretches for hundreds of miles distributing water throughout the whole valley; the extremely fertile soil has become an almost unbroken mass of cotton fields, vineyards, and orchards.

The initiative and the voluntary work of many thousands of collective farmers in gigantic undertakings for the common benefit of the people have become a characteristic feature of

life in the USSR. Many irrigation and drainage canals and a number of long arterial highways have been built in this way during the past few years.

Cotton growing in Uzbekistan has achieved some big successes. Collectivization, mechanization, the irrigation of larger and larger tracts of land have all helped toward producing three times as much cotton a year as in pre-revolutionary days. Before the Revolution half the cotton used in the Russian mills was imported; today the USSR grows enough cotton for its own needs and in this Uzbekistan, producing about two-thirds of the country's cotton, is the decisive factor.

The Ferghana Valley is mostly in Uzbekistan although some of the surrounding mountains and foothills belong to Tajikistan and Kirghizia; an interesting feature of the valley is the oil derricks and pit head workings of coal mines, for nature has made this region a rich one in every sense of the word. In the towns and bigger villages there are new cotton ginneries; in the town of Ferghana, there are new silk-winding mills, new oil plants, and a new textile mill. Kokand, Andijan, Namangan and Kuyasai, all in the Ferghana Valley are also becoming industrially important.

IV. IN THE FOOTSTEPS OF TAMERLANE

THE railway which goes west from Ursatievskaya takes us to the Zeravshan Oasis. The Zeravshan, the "Gold-giver," is a big river that was once a tributary of the Amu Darya, but today it does not go so far; the Zeravshan supplies all its water to the fields and finally disappears in the sands. The Zeravshan Oasis is another fertile, green strip between bare hills and valleys. Cotton, rice, alfalfa, and fruits are the chief produce. All day long the sun blazes down from a cloudless sky.

This oasis is the oldest settled agricultural region in all Central Asia. The region between the Oxus (Amu Darya) and the Jaxartes (Syr Darya) was well known to Greek geographers at

the time of Alexander the Great's campaign in this region. The antiquity of the irrigation system may be judged by the thickness of the soil strata which has been formed by the depositing of silt from the waters used to irrigate the fields and by the fertilizers that have been added to the fields. It is estimated that modern native methods of farming add one millimeter a year to the soil layer: in some of the oases the soil is over four meters thick (i.e. 4,000 millimeters), or 160".

The biggest towns of the Zeravshan Oasis, Samarkand and Bukhara, are the oldest towns of Central Asia. In Samarkand the majestic buildings erected at the time of Tamerlane are still to be seen: some of the most beautiful are the Gur Emir Mausoleum which forms the tomb of the famous conqueror who founded a huge Central Asian Empire in the fourteenth century; it is surmounted by a ribbed dome and is faced with multi-colored tiles; the Bibi Khanum Mosque which was erected to the memory of his favorite wife; this building is now in ruins, but a marvelous azure-blue arch has been preserved. Of great value from the standpoint of history and of art is the Timurid cemetery, Shah-i-Zinda, an ensemble of mausoleums. The steep staircase on the hillside which takes the visitor through the enfilade of tombs ornamented with delicate tiles and carving, creates a lasting impression. Another interesting ruin is that of the observatory built by Olug Bek, the grandson of Tamerlane, who was an eminent scientist. The Registan, within the bounds of Samarkand is a square, three sides of which are closed by a mosque, and two Moslem religious schools. These unique buildings have magnificent portals while the mosque is also interesting for its leaning minarets.

With the arrival of the Russians at Samarkand (and at every other big Central Asian town) a new town was built outside the old; this has now merged completely into the old town. In general, Samarkand is very much like Tashkent, but it is more original in architecture and more magnificent although it is smaller in size.

At the present time Samarkand's historical monuments are being carefully preserved. Restoration work is under way. Archeologists and Oriental scholars from all countries study the Samarkand monuments. In 1941, some interesting excavations were made around the tomb of Tamerlane. The skeleton of the great conqueror was found to be well preserved and specialists were able to determine the nature of the lameness which gave him his name (Timur Lang—Timur the lame; Tamerlane is a corruption of this). The monuments remaining in Samarkand show that in the past it was a city of tremendous importance as the center of the eastern Moslem world. The excellent native canals are evidence of the antiquity of farming in the Zeravshan Oasis which was densely peopled by an aboriginal population long before Timur's time.

There is a well-developed silk industry in Samarkand; in Bukhara there are cotton ginneries. Between the two cities in the Kutta Kurgan Region there is a huge reservoir that was recently built by voluntary labor; it is called the Uzbek Sea, and is of considerable importance to local irrigation.

Bukhara remained the capital of the despotic Emirate of Bukhara even after the coming of the Russians and up till 1920; the Russian administration did not interfere in the internal affairs of Bukhara to any great extent. There is, therefore, more purely local architecture than in Samarkand, for here we see the luxurious oriental features of architecture in such comparatively modern buildings as the Emir's palace as well as in ancient buildings.

The new town here was built at a respectful distance from Bukhara—a distance of almost eight miles. It grew up around the railway station which was built on that site in response to the persistent requests of the Emir who did not wish this new-fangled railway to be a source of temptation to his faithful Moslem subjects.

With such a distance between them, Old and New Bukhara

have not joined hands even now, although a branch railway has been built to connect them. New Bukhara (now called Kaghan, the name of the railway station) is a small independent town. The Soviet national policy has banished the fanatical religious and national intolerance that were rampant under the Empire; In Bukhara there are colleges, theaters, and clubs.

At Kaghan the railway again branches—the main line goes southwest and west through Charjow and Ashkhabad to the Caspian (this is the famous Transcaspian Railway built in 1881–88 which joined Central Asia to Russia economically); the other branch goes south to the Afghan border and to the mountains and valleys of the Tajik Soviet Socialist Republic among the gigantic Pamir Mountains.

V. THE NEW CAPITAL IN THE PAMIRS

THE railway leaves the irrigated valley of Zeravashan (on the lower reaches of which Bukhara and Kaghan are situated) and takes us across an arid steppe that is almost a desert. There is a branch line which goes off to the left and leads to the Shahrissab Oasis; this oasis is of interest as it affords us samples of all the Central Asian landscapes within a very short distance—dry steppe merging into desert at the lowest level, a flourishing oasis where man has supplied water, moister foothills between 1500 and 4500 feet where there is sufficient rainfall for farming without irrigation and where wild walnuts, apples, and pistachios grow; still higher the *archa*, a big juniper tree, grows and when we reach a height of about 10,000 feet above sea level the landscape becomes wild and rocky, and snow falls on many days of the year. The eternal snow line at some points is as low as 12,000 feet, but usually it does not come lower than 13,000 feet.

The main line railway turns sharply to the right and runs for a short distance through the Turkmenian Soviet Republic.

Then quite suddenly, without in any way preparing the passenger for the sight, the train reaches the banks of the Amu Darya.

The big rivers of Central Asia, when they are flowing across the plains, are all characterized by one specific feature which Russian geographers call "foreign rivers." They rise a long way from the plains in the high mountains and observe a sort of extra-territoriality in their water level; they are fed exclusively by the melting snows and glaciers in the "foreign" country and not by local tributaries. The "foreign river" cuts across the desert without having any great influence on it; the only vegetation is along the bed of the river where there are reeds and jungle-like growths, known in Central Asia as *tugai*. The job of the irrigation engineer is to make the "foreign" river a "native" river. We have already seen that at several points on the Syr Darya, a typical "foreign river," the irrigation problem is being successfully solved. The Amu Darya is a more difficult river to deal with—it contains a mass of water, three to four times as great, the current is swift and constantly changing and the river frequently washes away its banks. The places where the river breaks down its banks and overflows have been given a special local name—*deigish*. The *deigish* sometimes involves large sections of the river bank and the floods are a menace to villages, fields, and roads.

The train runs upstream parallel to the river and takes us to Termez, the southernmost point in Uzbekistan. This is the hottest place in the republic and an extremely dry one. The average July temperature is 32° C. and the absolute maximum is 50° C. which is not much less than the world record registered in the Sahara and in Death Valley, California. The winter is short and warm and for 240 days a year the temperature never falls below zero centigrade. The average January temperature is +3° C. and there are never more than ten days in the year when there is not an increase in temperature during the day. The heated air is unusually dry and the total annual rainfall is

112 mm. (under 5 inches). To understand the significance of this figure it must be compared with the average annual evaporation of waters on the plains of Central Asia which equals 1,500 mm.

Termez suffers badly from a hot southern wind which brings huge masses of hot air from the Afghan mountains; the wind itself is called locally "the Afghan."

There are many tortoises in the deserts around Termez, sand-colored animals as big as a dinner plate whose meat is a welcome addition to the dinner table and whose eggs are very tasty.

At Termez we turn away from the river in an almost northerly direction and then follow the Surkhan Darya, a right tributary of the Amu Darya, which will bring us to Stalinabad, the capital of Tajikistan. The road winds interminably over the mountains. Tajikistan in general is a mountainous country and the chains of mountains lie parallel to each other with quite high valleys in between.

The topography of the country makes communication difficult. In the past Tajikistan was almost devoid of roads but today the building of arterial motor roads has developed on a grand scale; these take the place of the old mountain paths traversed only by pack ponies and donkeys.

On the mountain slopes there are fields of wheat, barley, and maize, vineyards and orchards: there is an abundance of apricot trees. In the valleys that can be irrigated there is cotton. The Tajik farmers grow Egyptian type cottons with a long staple.

In the alpine pastures that lie amongst the stony wastes in the high mountains there are flocks of sheep (the Hissar Sheep is famous in this country), and herds of excellent horses (the Lokai and Karabai breeds are the best known). The *kishlaqs* are mostly in the valleys. Towering over the flat-roofed houses are tall poplar trees.

The trains stop at Stalinabad, the capital of Tajikistan. It is a

very young city which until quite recently was a village of mud houses called Dushambe. The new city is built on both sides of a small mountain stream; according to the 1939 census it had a population of 83,000 people.

In these mountains traces have been found of the prototypes of the cultivated grains from which the ancestors of the present Tajik developed their wheats, barley, and rye.

Stalinabad does not much resemble the older eastern cities. It was born in Soviet times and has wide streets, well-lit houses of a modern type in which eastern architecture takes the form of flat roofs, and white thick walls to keep out the heat; there are a lot of rapidly growing trees and shrubs on the boulevards and squares, and a large number of educational institutions which include colleges and an affiliate of the Academy of Sciences of the USSR.

Along the southern fringe of the city there are the big buildings of factories and not very far from the city there is a hydro-electric power station. There is a general feeling of space in the city, a feeling of harmony in the nearness to nature which has provided the city with a framework of mountains; there is also a feeling of youth for this is the youngest of the Soviet capital cities.

Before the Revolution Tajikistan had no industries of any sort. Today she has her own factories as we see in Stalinabad. A large section of Tajik industry is to be found in that section of the Ferghana Valley which lies within the republic's frontiers. There are silk mills, fruit preserving plants, oil wells and mines producing complex metal ores. In the Tajik part of Ferghana Valley there is farming of the same type as we saw in Uzbekistan. The valley was recently linked up with Stalinabad by an arterial road which crosses three high mountain ranges.

To the south of Stalinabad, beyond the mountain belt, lies the valley of the Vakhsh River, the biggest right tributary of the Amu Darya. Tremendous engineering works have been carried out in this valley and a large area has been irrigated and

is now sown to cotton. This is the richest farming region in the republic. The population of the valley is rapidly increasing; a large number of mountaineers have come down from the Pamirs to settle in the valley; new kishlaqs are growing up on all sides. In the center of the Vakhsh Valley there is the town of Kurgan Tiube where there are the biggest ginnery in Central Asia, flour mills, and other enterprises. A railway has been laid through the valley.

VI. THE ROOF OF THE WORLD

A TRIP to eastern Tajikistan offers many attractions. In this region we find the highest mountain peaks in the USSR. Below these peaks lie the Pamirs, the Roof of the World. Amid these inaccessible heights the USSR, China, Afghanistan all meet; from here it is only ten miles to India while mysterious Tibet is close at hand.

TAJIK S.S.R.

Area: 56,000 sq. miles.

Population: 1,500,000 (1939), majority Tajiks, also Russians, Uzbeks, Kirghiz.

Neighbors: West and north—Uzbek S.S.R.; south—Afghanistan; east—China.

Relief: Mountainous. High valleys, lowest of them in southwest part of republic divided by ranges of high mountains. Highest point in Republic and in USSR Mount Stalin—25,800 feet. Highest mountains Pamirs, in southeast.

Chief Rivers: Panj (upper reaches of Amu Darya); right tributaries, Kafirnigan, Vakhsh.

Part of Russia since 1866 (north); southwest was added to Bukhara (in actual fact to Russia) in the 70's; in the Pamirs line the formally delineated boundaries between Russia, China, Afghanistan, and the British Possessions in India established in 1895.

Soviet Power established in 1920. Until 1929 the republic was an autonomous part of the Uzbek S.S.R. It became a con-

stituent republic of the Union in 1929 on account of economic, cultural, and political development.

Autonomous Regions: Badakhshan Highland Autonomous Region; occupies large section of Pamirs. Center—Khorog.

Chief products: cotton, fruits, products of animal husbandry, complex metal ores.

Capital: Stalinabad.

There is now a splendid arterial road running through eastern Tajikistan right into the Pamirs Highlands. One end of the road is in Stalinabad and the other is at Khorog, in the midst of the Pamirs. Somewhat earlier Khorog was joined to Osh by a motor road; this leads to the eastern end of the Ferghana Valley. In this way the whole roof of the world is intersected with motor roads. In order to see this mountainous district, as a whole, and to appreciate to the full the majesty of this tangle of wild mountains, we propose taking an aeroplane trip over eastern Tajikistan following the route used by the daily airway service from Stalinabad to the Pamirs.

The Zeravshan, Hissar, Peter I, and Darwaz Ranges all seem to run towards an imaginary center; in the south they are joined by another range, the Yazgulem. Until quite recently this district was marked by a white spot on the map. The whole district has now been surveyed by Soviet scientists and mountaineers. The ranges are all very high, their summits wear a cap of eternal snow, and our plane has to fly at a very great height for safety reasons. Here, in the midst of the savagely majestic picture, where the earth torn in the throes of creative effort seems to have been frozen in its primeval state, stands out the tallest of them all—Peak Stalin. Mountains of this height, 25,600 feet, are to be found only in Asia and even in Asia there are few that surpass it. Behind Mount Stalin we see a second giant peak—Peak Lenin which is only a little over a thousand feet lower than Peak Stalin. It is over 60 miles from the first but it stands out clearly in the rare mountain air. In the valley below us the blue

Lake Kara Kul sparkles in the sun: this lake is nearly 13,000 feet above sea level!

In this chaos of snow, sharp rocks, and ice we can easily pick out the long white tongues of the glaciers. This is paradise for the glaciologist. Here he can study the longest glacier in the world, the Fedchenko Glacier named after one of the most prominent Russian explorers who worked in Central Asia. The glacier is about 50 miles long. On its upper reaches, at a height of 14,800 feet, there is the glacier station where scientists live the year round studying the locality.

Now we are well over the Pamirs. The western section of the mountain mass is cut up with deep narrow ravines. Tempestuous mountain streams race through the bottoms of these defiles. Amidst the crags there are fields of barley, huts built of stone, mulberry and apricot trees. There is often not even a footpath across these overhanging cliffs. Instead of paths there are pegs driven into the cracks in the rocks and twigs are laid across them for a foothold. The ravines of the western Pamirs are inhabited by Tajik farmers.

The eastern Pamirs is the highest section of the mountains: here there are very few ravines, but a number of flattish, bowl-shaped valleys strewn with gravel in which there are occasional patches of grass. The beds of these valleys are some 13,000 feet above sea level. The climate here is one of great continental contrasts, heat in the day and cold at night, the rainfall is not more than 60 mm. a year. The eastern Pamirs are inhabited by Kirghiz herdsmen.

The cultivated area has been greatly extended; the farmlands have spread to the eastern section where they grow turnips, cabbage, potatoes, and barley. At an altitude of about 13,000 feet, the big state-owned cattle ranch Pamir has been developed. Schools, hospitals, and cinemas have made their appearance. Until now the only fuel in the Pamirs was that provided by the bushes and dried dung, mostly that of the herds of yaks. Quite

recently coal mines were opened near Murghab in the Pamirs. Other minerals are also being worked.

The Badakhshan Autonomous Region which forms part of the Tajik S.S.R. is located in the Pamirs. The center of the region is at Khorog which lies on the Afghan frontier. There are automobile roads to this town from Stalinabad and from Osh, which crosses the high mountain passes and the heights of the eastern Pamirs.

Khorog is a new town with a teachers' training college, a secondary school, a printing works, and a hydro-electric power station. Khorog lies at an altitude of 7,000 feet above sea level; the town lies at the bottom of a valley and is surrounded by high mountains on all four sides.

VII. OVER THE WILD RIVER

IF WE go back to Kaghan and then take the mainline railway that runs from Tashkent to Krasnovodsk on the Caspian, we shall see that there is very little irrigated land to the west of Kaghan. The waters of the Zeravshan are almost all used up on the lands that lie higher up so that man has a hard fight against the elements in the low-lying regions. The sands of the Central Asian deserts in their natural state are held in place by the sparse vegetation that thrives in a dry climate and do not, therefore, move to any great extent. The excessive, unorganized pasturing of cattle on this vegetation destroys the bushes and grass. Then man himself has wastefully hewn down the only desert tree, the saxaul, for fuel. The saxaul is a strange tree, it is more of a bush, with a short, thick, quaintly twisted trunk and fantastically shaped branches jutting out of it, that are as thick as a man's arm. This is probably one of the best kinds of firewood in the world; it is very close grained (heavier than water) and burns very slowly, gives off a considerable amount of heat and leaves coals that glow for a long time. In the treeless regions of Central Asia (the woods are on mountain slopes that are not easily ac-

cessible), the saxaul is of great economic importance to a large region, but at the same time the felling of the saxaul trees which form a sort of framework holding the sands together, releases the loose sands which then obey nothing but the laws of the winds. It has been observed that in the Central Asian deserts there are the greatest numbers of dunes in the vicinity of the wells where the caravan routes meet and where there are always many people and animals. The sands that have been released are attacking the oases. Work is under way to consolidate the sands.

We will go as far as the Kara Kul Oasis, the last in the Zeravshan system, where this big river has dwindled to a tiny trickle of water. Kara Kul Oasis gives its name to the caracul sheep which provides the skins that make caracul coats, hats, and collars.

The Zeravshan would fall into the Amu Darya if its waters were not used up throughout its whole length for irrigating purposes. In the nineteenth century a number of years are recorded in which there was exceptionally high water and the Zeravshan actually reached the Amu Darya and thus earned the right to be called a tributary of that river.

On the banks of the Amu Darya we again cross the borders of Uzbekistan and enter Turkmenia. At Charjow, the railway crosses the river by a long bridge, much longer than the river bed, to allow for the increased width of the river at flood times when the snow melts in the mountains where it takes its source. Charjow is quite a big town (population in 1939 55,000), which has recently become a local industrial center. It is also an important transport center. The railway here connects up with the ships plying the Amu Darya and forms the connecting link between the rich oases on the lower reaches of the river and the outside world. There is also an arterial motor road which is gradually becoming more important. Lastly, Charjow is an airway center and is now of great importance as aircraft are used to connect up with distant points in the desert and with the oases. Aircraft which land at Charjow come from Tashkent,

Tashauz, in Northern Turkmenia, Urgench in the Khwarizm Oasis, and from Kara-Kalpakia. The aircraft carry passengers and urgently needed freight and have also been used to transport throughbred animals to oases that lie far away in the desert.

We shall take a trip by air to ancient Khwarizm and mysterious Khiva, and from there have a look at Kara-Kalpakia.

The aircraft leaves Charjow aerodrome; below us flow the yellowish-brown waters of the Amu Darya. We feel the great strength of this capricious river and realize where it got its name—Amu Darya means Wild River. Near the railway bridge we see a series of intricate structures, dams, fascines, and breakwaters to protect the bridge from floods when the snow melts in the mountains. The fight to control the river has been going on for many years and man is gaining mastery over the water.

The aircraft flies over the desert parallel to the river. The desert landscape is classical—complete emptiness and a feeling that the sands continue for hundreds of miles. The reddish hue that predominates over the yellow gave this desert its name—Kzyl Kum means Red Sands. At some points near dried-up wells we see the ruins of a mazar, the grave-shrine of some old Moslem saint, or the ruins of a *rabat*, a fortified caravan-sarai, or the conical structure built to protect the well from sun and sand which is known as the *sardaba*.

The past history of the Amu Darya was for a long time a geographical secret. We have the evidence of old-time geographers that the river fell into the Caspian. The writings of medieval travelers also mention this fact. Later the river apparently changed direction and turned into the Aral Sea. This theory was confirmed by the discovery of a gigantic dry river bed leading from the Sarykamysch depression (near the lower reaches of the Amu Darya) to the Caspian. This is the well-known Uzboi which was part of the Amu Darya riddle. In the eighteenth century Peter the Great, believing from information

received that the Amu Darya had been made to change its course by the building of a dam and realizing the great significance this river would have for trade between Russia and the Central Asian khanates if it were returned to its old course, sent a special mission to Khiva supported by a strong armed force; this mission had the task by means of negotiations or by use of force of destroying the imaginary dam and opening up to the Russians the waterway including the Volga, Caspian, and Amu Darya, the other end of which Peter believed to be somewhere near India.

The mission struggled with difficulty through the desert and reached Khiva, but was massacred to the last man by the treacherous Khan of Khiva. After this the lower reaches of the Amu Darya and the Uzboi had been investigated by geographers, geologists, and geomorphologists. Today we have a clear idea of the "biography" of the river. In the distant past the river sent part of its waters through the Sarykamysh Depression which was at that time a lake and the Uzboi into the Caspian; at that time, apparently the river itself carried much more water than at present. Later on the division of the waters of the Amu Darya between the Aral and Caspian Seas changed; even today the river is very capricious and frequently changes its course. It is difficult to say whether man played an important role in this or not; there has never been a very big dam on the Amu Darya, but in the region where the river begins to split into a number of channels, irrigation has been carried out from time immemorial. It is possible that there were once big engineering works here which affected the flow of the waters—the ephemeral dams which disappeared and left no traces as the result of floods. Apparently, part of the water still flowed through the Uzboi in the sixteenth century; it has been established that at an even later period, in years when the waters were particularly high, part of the flood entered the Uzboi, but evaporated completely before reaching the Caspian. In any case the farmers and

the khans that held the Khwarizm Oasis protected the Amu Darya, or rather its lower arms, from any extensive return to the Uzboi.

The aircraft lands in the Khwarizm Oasis which is almost completely surrounded by desert. This oasis is one of the most fertile in Central Asia, part of which belongs to Uzbekistan and part to Turkmenia. The waters of the Amu Darya water the fields of the Khwarizm collective farms and provide a very considerable amount of water, especially for the cotton. The water from the canals is raised to the fields by thousands of Persian wheels; in recent years many of these have been replaced by Diesel pumps. Boats and barges which traverse the bigger canals give this region the appearance of a sort of desert Holland.

In ancient Khiva the tall minarets, shrines, Moslem schools, and other buildings of past days and the tiny houses huddled in little narrow winding streets are more like a stage decoration than reality. The bazaar, half of which is roofed over, consists of streets of potters, carpet weavers, metal workers, shoemakers, and other artisans. Khiva, in general, is like a museum town, a unique relic of the medieval East. Around the palace, which was once inhabited by the formidable Khan of Khiva, there is a fine shady garden. This is the only place in Khiva where one does not feel overcrowded and oppressed.

At a distance of about twenty miles from Khiva there is the town of New Urgench, the present center of the region with its new houses, theaters, clubs, and wide streets generously supplied with greenery.

In the old days the Khwarizm Oasis was difficult to get to. Today we are traveling there by air on a plane that makes the regular journeys. We could also have gone up the Amu Darya by steamer.

On the lower reaches of the Amu Darya is the Kara-Kalpak Autonomous Republic which forms part of Uzbekistan; the inhabitants are Kara-Kalpakians, Uzbeks, and Kazakhs. A con-

siderable part of the republic is desert land. In 1938 the Kyz-Ket-Ken Canal was opened to bring water from the Amu Darya; this canal now irrigates large areas of land. In the center of the irrigation land is the new town of Nukus, to which the capital of the republic was transferred from Turtkul on the banks of the Amu Darya. One of the reasons for the transfer was the *deigish* we spoke of before, the floods that constantly menaced little Turtkul. The Kara-Kalpak farmers grow cotton and the alfalfa that provides the best seed in Central Asia. In Muinak, on the shores of the Aral Sea, there is an important fishing and fish canning industry. Animal husbandry is the chief occupation of the desert people in the lands surrounding the oases; the herds are mostly caracul sheep.

The people of Kara-Kalpakia wear long tunics like the Kazakhs and big shaggy sheep-skin caps like the Turkmenians. It is these huge caps that gave them their name—Kara Kalpak means Black Hat. Their Uzbek neighbors in the Khwarizm Oasis wear simple caps, they are either white or red; this head-dress distinguishes them from the southern Uzbeks who usually wear a turban or a skullcap.

Two or three hours flight will bring us back to Charjow. Having traveled along the borders of Turkmenia we will now enter the republic; we may cross the entire expanse of Turkmenia by rail.

VIII. ACROSS THE SEA OF SAND

THE Turkmenian Soviet Republic is the most arid of all the Central Asian republics. The greater part of its territory is taken up by the Kara Kum desert (Black Sands), although the majority of the population live in the cotton-growing oases of the south at the foot of the mountains. The railway was planned to pass through the chain of rare oases and its construction as well as its further exploitation (for example, the supply of water), was a matter of some considerable difficulty. In parts

the railway runs for dozens and even hundreds of miles through arid desert where the moving sands are a constant threat to the permanent way; in places the railway is protected from the sand in the same way as the northern railways are protected from snow—by wooden fences. In addition to the usual railway divisions—traction, traffic and exploitation, this particular railway has a special “sand service.”

A large part of the desert, however, consists of sands that have been consolidated and are firmly held together by vegetation. This is the dry, hard, camel scrub which provides feed for the sheep and camels.

In recent years farming has been introduced into the desert. Wells are being sunk. Wind motors are being erected to pump up the subsoil waters. There is a method of removing salt from the desert water by freezing based on the principle that salt does not enter into the composition of the ice. In the middle of the desert there are modern settlements with shops, schools, and medical centers. Scientific stations (the best known is Rapetek, which we shall pass), have worked out methods of growing crops in the sand. Grapes, for example, grow well in the bottom of deep trenches. Melons, cantaloupes, and vegetables are grown in the desert. Trees and shrubs are being planted around the settlements.

TURKMENIAN S.S.R.

Area: 171,000 sq. miles.

Population: 1,300,000 (1939). Majority Turkmenians, but many Russians, Kazakhs, Kara-Kalpakians, Uzbeks.

Neighbors: North—Kazakhstan; east—Uzbekistan; south—Iran and Afghanistan.

Relief: Plain: in northwest rocky mountains of Kopet Dag.

Chief Rivers: Amu Darya, Murghab, Tedzhen, Artek. Dry river bed Uzboi (formerly part of Amu Darya channel).

Part of Russia since 1869 (west), 1884 (southeast).

Soviet Power first established 1917, finally victorious after Civil War, 1919.

Produce: Oil, mirabilite, sulphur, wool, meat, caracul fur, horses, cotton, southern farm produces, fish.

Capital: Ashkhabad.

The railway from Charjow crosses the fringe of the Kara Kum and reaches the town of Mary (Merv) in the Murghab Oasis. The Murghab and the other small rivers in this desert have no mouths. No sooner do they leave the mountains than the rivers grow shallow, form an inland delta and then disappear in the sands. In the places where their waters serve to irrigate the soil there are villages and cotton is grown.

At a distance of 180 miles further south is the town of Kushka which is near the southernmost point in the USSR ($35^{\circ}38'$ N. Lat.). The railway follows the Kopet Dag Mountains. It is hot in the train. If we close the window we shall be stifled and if we open it we shall be covered with fine brown dust. For many long hours the view from the window does not change: on the left the silhouette of the distant mountains with trees only in the ravines and to the right the endless sandy plain.

This is an old inhabited region. From time to time we see the ruined walls and towers of what were once rich cities.

At last we reach Ashkhabad, the capital of the Turkmenian Soviet Republic (127,000 inhabitants in 1939). It is a big city with straight streets, many avenues of trees and *ariqs* in the streets; the *ariqs* here take the form of concrete canals, otherwise the water would all be absorbed by the sand. The sight of so much greenery is very refreshing after the tedious journey across the desert.

The environs of Ashkhabad form a somewhat small oasis that is unforgettably picturesque and extremely fertile; it lies on the slopes of the Kopet Dag Mountains. There are vineyards (Turkmenian wines, incidentally are gaining favor in the USSR), orchards, plantations of roses, and large numbers of cottages in which the people of Ashkhabad spend the hot summer months.

New industries have been started in Ashkhabad which before the Revolution had no factories at all; there are now a cotton mill, silk-winding mill, a big glass works, a meat packing plant, and a footwear factory.

Ashkhabad is the Turkmenian cultural center; there are several colleges, theaters, a cinema studio, and an Affiliate of the Academy of Sciences of the USSR.

To the north of Ashkhabad there is a big sulphur deposit in the Kara Kum Desert. A plant has been built to process the sulphur and communication with Ashkhabad is maintained by a motor road and by air.

From Ashkhabad the railway goes farther to the west through a long string of oases famous for the breeding of race horses. The women of these regions are renowned carpet makers; Turkmenian carpets are known for their dull red tone and their beautiful designs in soft colors.

In the well protected valleys of the Rivers Sumbar and Atrek to the south of the railway subtropical crops are grown, one of the most important being the Mexican rubber-bearing plant, the guayule. Date palms first bore fruit on Soviet territory in these valleys.

After passing the oases the railway continues across the desert to the Caspian, to the port of Krasnovodsk. This town was founded some eighty years ago mainly as a place of residence for the Caspian sailors and the railwaymen. The town is not a very pleasant place to live in. There is insufficient fresh water although every effort is made to obtain the greatest quantity from local sources; most of the water used in Krasnovodsk is brought across the Caspian from the River Kura in tankers. Krasnovodsk is the only town in the Soviet Union where water distilling installations similar to those used on board ship have been erected.

The houses in Krasnovodsk are European in type but the majority of them have flat roofs.

North of Krasnovodsk is the big bay known as Kara-Bogaz-

Gol. This huge expanse of water (7,000 square miles) is connected with the Caspian through straits which narrow down to about 200 yards at one point. The sea water rushes through into the bay at a very high speed; evaporation of the sea water has left large deposits of various kinds of salts in the bay. The most important salt found here is mirabilite (Glauber's salt in its native state), which in the cold weather settles in the form of crystals. The storms bring the crystals to the shore where they are piled up in huge reefs. From the air it seems that the whole coast of Kara Bogaz is covered with these huge white patches that look like mildew between the blue of the sea and the yellow sands of the desert. Mirabilite is now gathered on this coast and the new township of Kara-Bogaz-Gol has grown up. The local people have laid out vineyards and vegetable gardens in deep trenches around the settlement.

There are treasures to be found in the earth of western Turkmenistan as well as on the surface. Southeast of Krasnovodsk there is the oil-bearing region of Nebit Dag which has been known to geologists for a long time, but which has only been surveyed and developed recently. Oil is also found on the island of Cheleken.

We have now crossed Central Asia from Tashkent to Krasnovodsk and have made a number of trips off the main route into the interior of the country; although we have taken a long trip to reach a spot on the Caspian opposite Baku, we still have not seen the eastern section of Soviet Central Asia, the strip that runs along the foot of the gigantic Tien-Shan Mountains, that is along the Chinese frontier. In order to see southern Kazakhstan and Kirghizia, both very interesting countries, we must travel by the Turksib or Turkestan-Siberian Railway, which connects the eastern part of Central Asia with Siberia. We shall, therefore, go back to Tashkent and from there via the railway junction at Arys take a train on this comparatively new line (opened 1930).

IX. IN THE TIEN-SHAN MOUNTAINS

Our road lies along the foothills of high mountains: on our right hand they form a continuous wall surmounted by snow-caps. On the banks of the mountain streams there are fertile green oases. Around us everything is desert waste, but in the oases there is water and shade. The collective farmers have dug new irrigation canals and their fields contain cotton, grapes, rubber plants, lentils, and sugar beet. The harvest yield of the beets grown in this region constitutes a world record—almost 60 tons to the acre—despite the fact that sugar beet is a new crop here.

We pass through Chikment, the biggest town in South Kazakhstan, where there is a lead plant bigger than any other in Europe or Asia. This alone is evidence of the mineral riches to be found in Kazakhstan. In the same town there is an interesting factory which manufactures santonin (a vermifuge) from the seeds of the local zedoary plant.

Our next stop is at Jambul, until quite recently a quiet provincial backwater; today it is the Kazakh sugar refining and spirit distilling center. A little further north are the Kara-Tau Mountains where important phosphorite deposits have been discovered; the chemical industry is beginning to develop around these deposits.

At the station of Lugovaya the railway divides, the right-hand branch goes to Frunze, capital of the Kirghiz Soviet Republic, while the main Turksib line continues across the whole of southern Kazakhstan. We will begin with Kirghizia, as it is nearer and we will then come back to the Turksib.

Kirghizia is a mountainous country about five times the size of Switzerland. A large part of it consists of high, intermingling mountain chains capped with eternal snow, the western end of which we saw in the distance when we were in Uzbekistan and Tajikistan. The valleys and the high-mountain regions are very

different both in aspect and in economy; the landscape in general is divided into a number of clear-cut zones on a vertical scale. The mountains play an important part in the life of the country and in determining its frontiers. Northern Kirghizia has approaches through the valleys of the Talas and Chu Rivers; Southern Kirghizia is reached through the Ferghana Valley. The mountains which until recently formed an impassable barrier between the northern and southern parts of the country hindered a uniform economic and cultural development. The recently built arterial road links up southern Kirghizia with the northern half of the republic and with the capital Frunze; railway communication between the two parts of the country is still far from satisfactory: to reach Frunze from the Jelalabad health resort, or the silk town of Osh, or the coal mines of Kzyl Kii, all of which are railheads in southern Kirghizia, we have to travel westward by rail along the Ferghana Valley, then north through Tashkent to Arys and then eastward again over the Turksib through Lugovaya. In making this journey we cross the territory of Uzbekistan, Tajikistan, again Uzbekistan and Kazakhstan, to say nothing of Kirghizia itself at the beginning and end of the journey. It is easy to see from this that only the uniform political system of all the republics of the USSR, none of which have any customs boundaries, could reduce the difficulties of these winding frontiers to a minimum.

The city of Frunze is in the Chu Valley between the Kirghiz Ala Tau Mountains and the Chu River.

The streets are lined with rows of pyramidal poplars. In the center of the city is the new building of the government offices. On the outskirts there are the meat-packing plant, cloth mills, clothing, tobacco, and leather-goods factories. There is a big Kirghiz *intelligentsia* in the town including scientists, doctors, poets, and artists. These younger intellectuals have been brought up under the conditions of the state and national independence which Kirghizia enjoys under Soviet rule. In Frunze, there is an Affiliate of the Academy of Sciences of the

USSR. The city is growing rapidly. Since the Revolution the population has grown from 14,000 to 93,000 (the latter is the figure of the 1939 census).

From Frunze a motor road runs up the broad valley of the Chu into the interior of Kirghizia. A few years ago a car making this trip had to jump the ariqs and raised clouds of dust which covered the whole horizon. Today there is a wide, clean motor road.

A new irrigation system with a big dam at Chumysh has been built in the Chu Valley: the chief crops grown are the coarser kinds of southern hemp which are used in place of jute in the manufacture of gunny and ropes. In recent years great progress has been made in the cultivation of the sugar beet and excellent harvests are obtained. Sugar refineries have been built to deal with the beets. There is also a large area under wheat in the Chu Valley; Kirghizia helps supply wheat to the other Central Asian republics.

If it were not for the mountains we should think we were in the Ukraine in many of the Chu Valley villages: tall poplar trees, white-painted cabins, sunflower patches, a warm climate, and the Ukrainian language. The Ukrainians settled in this valley dozens of years ago. Other villages are inhabited by Lungans, a people who came from western China in the nineteenth century and who have retained many Chinese traits.

At the top of the valley the mountains close in and the Chu River rushes out of a deep and narrow ravine called Buam. The road passes through the gorge and reaches Lake Issyk Kul at an altitude of nearly 5,000 feet above sea level. The lake is like a small sea and there is a steamship service crossing it. North of the lake is the Kungei Alatau, to the south the Terskei Alatau, snow-capped mountain ranges that are reflected in the blue water of the lake. The lake has an area of 2,400 square miles. There are health resorts around the hot springs nearby. The lake—whose name in Kirghiz means "Hot Lake"—does not freeze in winter.

In the east the mountains stand back some distance from the lake. Here, around the town of Przhevalsk there is a level fertile area where wheat and poppies are grown. There are many orchards in this part of Kirghizia. High above the lake there is a spot from which we can get a beautiful view of the whole valley; here stands a granite monument with the bronze figure of an eagle over the grave of Przhevalsky, the Russian explorer of Central Asia. He died on the shores of Issyk Kul when he was making the preparations for his fifth journey of exploration. Each of his trips lasted several years and brought considerable information on the geography of the then little known parts of Asia. It was his last wish that he be buried overlooking Issyk Kul.

Formerly the Kirghiz herdsmen spent the winters here in earthen bunkers. Today there are well-built villages with warm sheds for the cattle. One of the chief branches of Kirghiz industry is cattle breeding which depends largely on the mountain pastures.

In the valley of Jargalon at the eastern end of Issyk Kul coal deposits have recently been found and are being worked. The coal is sent across the lake to the western shores.

The Issyk Kul valley is rich both in farm produce and in minerals. It is difficult to get the produce out of the valley as the only way is along the arterial road through the Buam Gorge.

KIRGHIZ S.S.R.

Area: 73,360 square miles.

Population: 1,500,000 (census of 1939). Majority Kirghiz, many Russians; some Uzbeks, Ukrainians, Dungs.

Neighbors: North—Kazakh S.S.R., west—Uzbek and Tajik S.S.R., south—Tajik S.S.R., southeast—China.

Relief: Mountainous; there are groups of valleys concentrated around Ferghana and Issyk Kul and on northern borders of republic. Many high mountain peaks.

Chief Rivers: Naryn, Chu, Talas.

Lakes: Issyk Kul (2,400 sq. miles) at a height of 5,000 feet above sea level. Water slightly salt. Ice free.

Part of Russia since 50's-70's of 19th century.

Soviet Power established 1917, finally victorious 1919. Kirghiz Autonomous Region founded 1924, became autonomous republic 1926; economic, political and cultural development led to foundation constituent republic, Kirghiz S.S.R. in 1936.

Produce: Hides, meat, wool, farm produce, sugar, coal, rare metals, complex metal ores.

Capital: Frunze.

A railway is now being built from Frunze to the port of Rybachy at the western end of the lake, which will improve matters.

The mountain pastures can only be reached on the short-legged, sturdy Kirghiz ponies. The highland regions are every bit as beautiful as Switzerland. There are savage crags, mountain lakes, roaring streams, and an abundance of flowers. Above the belt of dense fir forests there are the mountain pastures. Here the herdsmen live in their round yurts together with their herds. They come out to greet us with the usual Kirghiz hospitality, pour out kumyss, intoxicating, sour mare's milk, from a skin bag for us to drink and sit down to question us about the latest events in the outside world.

Beyond the valley of the River Sary Jas which flows into the Tarim Basin, we get a view of the endless mountains which form the frontier with China, awe-inspiring giants that are covered with snow almost to the foothills. Above them all rises the fluted cupola of the peak of Khan Tengri—the Prince of Spirits.

X. THE GARDEN CITY

Now let us get back to Lugovaya Station and continue our trip along the Turksib Railway. This railway is nearly a thousand miles in length and joins the Central Asian republics to Siberia; the railway has played an important part in the development of

both of these regions. Grain and wood came to Central Asia from Siberia, products which Central Asia was urgently in need of. The building of the southern section of the railway began at Lugovaya. The Turksib was one of the first big efforts at remaking the economy and geography of the country. Like the Dnieper Power Station and Magnitogorsk the whole country followed the building of Turksib with tremendous enthusiasm. Although the railway was built at record speed a large number of difficulties had to be overcome, mostly due to the fact that large sections of the railway were built in uninhabited territory; it was the railway that started the development of these regions and in general "discovered" southeastern Kazakhstan, a rich and beautiful country and brought into the sphere of Soviet economy.

To the east of Lugovaya, beyond the Chu River and the Chokpar Pass, is the city of Alma Ata, the capital of Kazakhstan. This is now one of the most beautiful cities in the USSR which has been built up of snow-white, airy dwelling houses and monumental public buildings; streets, boulevards, and public gardens are a mass of shady green; the whole city has been built in recent times and seems more like a beautiful health resort than a capital city. Until recently Alma Ata (formerly Verny) was a small Cossack settlement with a fort, the military and administrative center of the Cossack troops of Semirechye, a stronghold of the Russian Cossack army.

The geological destruction of the huge chain of mountains called Zaili Alatau, the northernmost chain in the Tien-Shan system, broke up the country to a very great extent: it is intersected by rivers running down from the mountains and abounds in cone-shaped hills that have been left behind by the processes of destruction. Alma Ata stands on one of these cones, which leans toward the mountain range. It was difficult to take a railway into Alma Ata and the main line was built across the plain with a short eight-mile branch running into the city.

When we leave our train to transfer to the branch line we are

immediately struck by that excellent blending of architecture and natural surroundings which captivates us still more when we get to know the city better. The station building is a light, airy pavilion that looks somewhat like the Kursaal of a southern sanatorium. Before the station there is an extensive asphalted square with flower beds, ornamental trees and bushes, and statuary dotted about the lawns. Towering above the plain is the snow-white wall of the mountains which despite the fact that they seem quite close complete the sensation of space and freedom.

As the branch railway climbs uphill to the city the mountains come closer and closer to us. This is, naturally, an optical illusion, but we feel that we have only to stretch out a hand to touch them.

The city is divided up by straight avenues which rise rather steeply; at the end of each of the meridional streets there is the same panorama of the mountains, the lower slopes of which are covered with dense forests of stately Tien-Shan firs. The whole area between the city and the mountains is taken up by apple orchards; the big, red, sweet apples grown at Alma Ata sometimes weigh as much as two pounds each. The name of the city—Alma Ata—means Father of Apples.

On either side of the long, straight asphalted streets there are two rows of tall poplars, four rows in all. The city contains a large number of splendid public buildings—the government offices, the Turksib Railway offices, the Kazakh Affiliate of the Academy of Sciences, the public Central Library—almost every one of these buildings has beautiful verdant gardens. Outstanding amongst the big buildings of Alma Ata is the massive block of the new Opera House whose architecture blends wonderfully with the background. The buildings of Alma Ata are specially designed to withstand earthquakes; tremors are of quite frequent occurrence and the soil which forms the hill on which the city stands—the remnants of geological destruction—is rather unstable.

On all the boulevards and in the public gardens of the city there are many groups of statuary. The ariqs which bubble merrily along all the main streets are mountain streams that have been diverted through the city and disappear into the desert beyond. The city of Alma Ata stands on an island above a sea of sand; its builders seem to have raised it high above the plain so that the dwellers in the city could get a better view of their vast country.

In addition to being a big and beautiful city (population in 1939—231,000) it is also an important industrial center—food packing, tobacco, footwear, textile, and clothing are the main industries. There are also a few engineering enterprises that expand during the war into big plants when Kazakhstan formed part of the Red Army's arsenal. Another wartime improvement was a group of power stations that was built in the hills.

Alma Ata has become a cultural center which is all the more significant on account of the fact that until quite recently Kazakhstan was a country with a backward nomad economy. In a country where the population was almost completely illiterate twenty-five years ago, there are now more than a million children attending school. In 1939, 76.3 per cent of the population could read and write. There are many colleges and research institutions in new Alma Ata and a number of theaters. The climate and the variety of landscape around the city make Alma Ata an excellent location for a film studio; the studios were greatly expanded during the war when Alma Ata was known as the Soviet Hollywood. Another interesting feature is the studio attached to the opera house where talented young Kazakhs train for both the national opera and the ballet.

After leaving Alma Ata the Turksib railway turns away from the foothills and crosses the big river Ili which has its upper waters in Sinkiang (China); there is a steamship service between Kazakhstan and Sinkiang, the steamers starting from the town of Iliisk where there are shipyards and a food packing industry. The Ili is another of those "foreign rivers" we spoke about be-

fore and there are few villages on its banks. Beyond the Ili w once again come into deserts of the type we have already see in Uzbekistan and Turkmenia. The deserts are divided by fl patches of clay. Along the Turksib railway there are a numbe of new oases that grew up after the railway. The Karatai Rive provides water for irrigation. There is a new town, Ush-Tobe, town of whitewashed earthen houses built on wide streets; th trees with which all the streets are planted are still quite youn but the climate is so favorable to vegetable life that within very few years these same streets will be shady avenues.

XI. THE HEART OF A CONTINENT

THE Ush Tobe Oasis is behind us—again wide expanses of y low sand, occasional, waterless stations, a lonely camel phil sophically chews the thorn scrub—Central Asia! Here we a right in the heart of the gigantic land mass.

Suddenly, at a little, scarcely noticeable, wayside station v are greeted by Kazakhs offering fish for sale to the passengers the train. In a few minutes the fish sellers are all round us off ing their wares. The fish are salt-water fish! A strange paradox seafood in the center of a continent, in the heart of the dese The answer is simple: if we walk out beyond the station buil ings we shall see Lake Balkhash.

Balkhash is slightly larger than Lake Ladoga; its surface ar varies considerably in accordance with the flow of water fr the mountains but its average is over 6,500 square miles. Li the Caspian and the Aral Sea, Lake Balkhash is a land-lock basin; it is a good example of the way water becomes salt in a c climate.

Lake Balkhash is 630 miles long but is narrow and curved l a boomerang, not unlike a very much larger edition of Londo Serpentine. The waters of the big Ili River keep the western e of the lake so fresh that the water may be drunk. The east end is freshened only by such minor rivers as the Kanatal, Lep



CONTRAST IN THE SOVIET UNION

ABOVE:—*A cornfield in the Pamirs, "Roof of the World."*

BELOW:—*Hunters with their spoil in Novaya Zemlya, in the Soviet Arctic.*

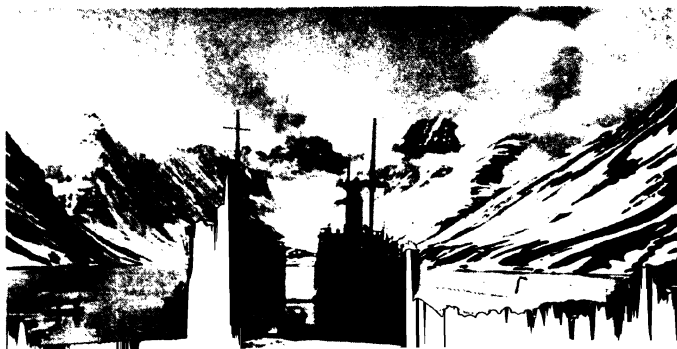




THE SOVIET FAR EAST

ABOVE: *The busy harbour of Vladivostok, "Ruler of the East."*

BELOW:—A Soviet Pacific port in winter.



and Ayaguz which do not make up for the evaporation; the consequence is that the salt content of the water is continually growing; in some of the little bays that are cut off from the lake itself by long sandy spits, the salt is regularly deposited—a Kara Bogaz Gol in miniature! These bays are natural warehouses of various salts. The “bridge” between the two parts of the lake is only two or three miles wide and is really a sand bar quite near the surface of the water; this bar prevents the fresh waters of the Ili from reaching the eastern part of the lake. Until recently there was a big bay at the southeastern end of the lake (Ala Kul) which was cut off from the main lake by a sand bar that was built up by silt; once it became separated Ala Kul received no more fresh water, salification increased as the water was evaporated by the sun, salt-loving reeds choked the whole expanse until today it is practically dry. Every time part of the lake gets cut off in this way the surface from which water is evaporated is naturally reduced and the remainder of the lake becomes gradually fresher.

North of Balkhash there is an arid region with a few small streams that carry water in spring when the snows melt but are dry in summer (*nullahs*). The land is hilly, some of the heights reaching 4,600 feet. This is the Kazakhstan fold whose present topography is due to the constant destruction of big mountain folds. The country is very rich in all kinds of minerals, in fact Kazakhstan, in general, and its central regions in particular, is so rich in minerals that the Urals is probably its only rival.

The regular study of the geology of the region to the north of Lake Balkhash is to a considerable extent the work of young Kazakh geologists, especially during the more recent years.

On the shores of the lake there is the extensive copper ore deposit at Kounrad. The opening of the mines and the building of the huge Kounrad Refineries was a matter of very great difficulty. The whole northern shore of the lake is a long way from the nearest railroad so that building materials, workers, and food supplies had to be brought across the lake, from that little station where we were first surprised at the abundance of salt-water

fish. The steamers and barges were brought here in parts and assembled on the lake.

Another important mining center has been developed in Central Kazakhstan at Karaganda, also to the north of the lake. From Karaganda a branch railway line was built to connect up with the Trans-Siberian Railway which runs to the north. On this line Karaganda coal joined that from Kuznetsk which was on its way to the Urals. Later on another railway line was built to provide a shorter route from Karaganda to Magnitogorsk via Akmolinsk and Atbasar. Karaganda has now become the third coal field in importance of the Soviet Union. In 1939, the new city had a population of 166,000 but today the figure is very much greater. Karaganda today is not only a mining town but has many growing industries including an iron and steel mill.

For the irrigation of the greenery in the town, for the vegetable gardens and for the state farms in the surrounding desert a dam was thrown across the little Nura River which usually dries up in summer, to form a big artificial reservoir to hold the spring waters. The big copper refineries are at Jezkazgan, in the arid steppes to the southwest of Karaganda; a railway connects the two towns.

In recent years the railway line has been continued from Karaganda to the lake so that the new town of Balkhash has railway communication with Karaganda and with the whole country. These new lines are 300 and more miles each in length.

Throughout the whole of Kazakhstan, even in the driest spots a completely new type of economy has been built up during the past few years.

After passing Lake Balkhash the Turksib railway goes almost due north into Siberia.

Before leaving Kazakhstan the railway crosses the wide Irtysh River, a left-hand tributary of the Ob. Here, at the town of Semipalatinsk there is a big meat-packing plant, leather goods factories, and a rapidly growing textile industry.

Higher up the Irtysh is that branch of the Altai Mountains

which is extremely rich in complex metal ores. The Altai Mountains are in general high, some of the peaks having eternal snow caps. In this region there are large deposits of lead, zinc, tin, silver, gold, copper, and the rare metals. Old mines and factories have been rebuilt and enlarged and new ones opened. The center of this region is the city of Leninogorsk. A big power station is being built on the Irtysh to provide current for the refining of copper and other metals.

The southwestern slopes of the Altai belong to Kazakhstan, the north is in Siberia: the part known as the Altai Steppe is typical Siberian—its chief towns are Rubtsovsk, Barnaul and Biisk.

This is the end of our Central Asian journey and there is no doubt that the most astounding republic that we have visited in the course of our travels is Kazakhstan, the one we are now leaving. It contains everything from glaciers to deserts and its vegetation ranges from mountain firs to desert saxaul. Its mineral riches have only just been touched and much still remains to be developed.

The greatest change is in the life of the Kazakhs. Twenty years ago the region was very much like what it was in the days of Genghis Khan. The Kazakh shifted his felt tent from place to place on the back of a camel, his whole life was spent in the saddle, he had no knowledge of writing, his only medical practitioner was the witch doctor. Today there are many Kazakh doctors, professors, actors, and poets, famous throughout the Soviet Union who were born in these nomad yurts.

The country is many millions of years old; its people have existed for thousands of years. New Kazakhstan is twenty-five years old but these twenty-five years are equal to many centuries.

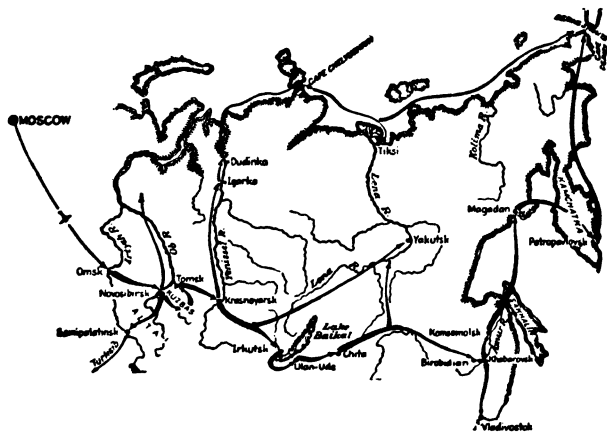
7. ACROSS SIBERIA TO THE PACIFIC

I. ON A GIGANTIC SCALE

THE LONGEST transcontinental railway in the world stretches from Moscow to the Pacific Ocean. It is only when we travel from one end of this railway to the other that we fully realize how big the Soviet Union is. An express train takes nine days and nights to cross the Urals and reach Vladivostok. Siberia is almost one-third of Asia and its area is sufficient to accommodate Western Europe three times over.

The western part of Siberia is a plain, the biggest in the world. The central part of this plain does not slope sufficiently to permit water to run and is exceedingly swampy; the tiny streams scarcely move and join their waters to form the swamps of Vasyuganye. Farther to the southwest, near the South Urals mountains, the lowlands are broken by thousands of small lakes which are filling depressions in a plain that is as flat as a pancake. The eastern part of Siberia, to the east of the Yenissei, is all highlands. Here is the East Siberian plateau with the Sayan, Yablonovy, Stanovoy, Jugjur, and Verkhoyansk Mountains arranged in an arc around its southern and eastern edges. The surface of the plateau is covered with a large number of isolated, steep knolls between which are numerous hollows. The region which lies on the eastern slopes of the continent falling gradually to the Pacific is that part of Siberia which we call the Soviet Far East.

The gigantic Ob River which with its tributary the Irtysh has a length of 3,200 miles, flows through Western Siberia into the Arctic Ocean; Eastern Siberia is intersected by mighty Yenissei, 2950 miles, and the majestic Lena, 3114 miles. At the junction of the Sayan and Yablonovy Mountains there is a deep depression filled by Lake Baikal; it is the deepest lake in the world, its greatest depth being about 4,700 feet. The translucent An-



gara River, the Yenissei's biggest tributary, flows out of the lake. The big Siberian rivers all flow from south to north and enter the Arctic Ocean. The big river of the Far East, the Amur, 2,900 miles long, forms the one important exception as it flows from west to east and enters the Pacific.

The Arctic Ocean stretches from the Barents Sea along the whole of the north of Siberia. The Kara Sea lies between the mainland and the islands of Novaya Zemlya and Severnaya Zemlya; both the Ob and the Yenissei fall into the sea. The Taimyr Peninsula with Cape Cheluskin, (the northernmost point in the USSR—almost 70° N. Lat.) separates the Kara from the Laptev (Nordenskjöld) Sea into which the Lena falls. Still far-

ther to the east are the East Siberian and Chukotsk Seas. All these seas are ice covered for a considerable part of the year. The winds and waves smash the ice and pile it up; in stormy weather huge piles of ice called *toros* break off into separate floes.

The area north of the Arctic Circle is the Siberian tundra. It is lowland in the west and hilly in the east. To the south of the tundra stretches the long strip of the taiga with its jungles. In the west the taiga is called *urman*; damp, swampy, conifer forests with occasional birch and asp; the taiga of eastern Siberia, especially east of Lake Baikal is much more majestic. Here are the gigantic, age-old larches. The tangled jungles are almost impenetrable, especially in the hollows. Here we find the coldest places in the world.

South of the densest jungles there are mixed forests which gradually give way to wooded steppes where the birch groves alternate with open, treeless spaces. The Trans-Siberian Railway runs through this zone. In the west the open and wooded steppes join up with the semi-arid regions of northern Kazakhstan; in the east they are not continuous but form a number of isolated islands (Minusins Steppe and the Transbaikal Steppes).

The Far East deserves special attention. In the north there is the tundra (on the Chukotsk Peninsula), further south the taiga and then a belt of open lands—the Amur Prairies; the Pacific Ocean has made its mark on each of these zones. The Far East, especially the southern parts has a monsoon climate. The vegetation includes many varieties of plants that are peculiar to Manchuria. The climatic contrasts found in the Far East are such that within a comparatively short distance there are tigers and sables, reindeer and wild deer, Arctic partridges and the red-legged ibis.

In order to cut down the time required for our last journey round the map of the USSR and not repeat our trip across the Urals and the Volga Basin where we have already been, we will take a plane to Western Siberia and begin our tour from there by rail.

The airplane trip shows us very well how big a piece of the world is included in the Soviet Union. Even at the Moscow airport we see from the timetables that a plane traveling from Novosibirsk to Moscow gains four hours on account of the different longitude and can do the whole journey in daylight. As we are traveling "against the motion of the sun" the amount of daylight available for flying will be less. The air service timetable has to take these "cosmic" factors into consideration.

While the plane is flying over parts of the country that we have already seen, we will run over something of the history of the land we are to visit.

II. PAGES FROM THE PAST

UP to the sixteenth century the tremendous expanses of Siberia were inhabited by small, backward tribes of hunters and reindeer breeders in the north and nomad cattle-breeders in the south. A handful of bold Russian Cossacks headed by Yermak crossed the "Stone Belt" (the Urals) at the end of that century. At about this time the nomad Siberian Tatars had begun building a strong feudal state (the Kuchum Kingdom) between the Irtysh and the Tobol, subduing the weak native tribes, converting them to Islam and levying tribute from them. In 1583 the fearless Cossacks defeated the formidable Khan of Kuchum. The small tribes of Ostyaks, Voguliches, Yugras, and Nenets that lived along the Ob and the Irtysh, all of whom had been forcibly included in the Kingdom of Kuchum, preferred to owe allegiance to the Tsar of Moscow. The Kuchum Tatars also surrendered in groups, but some of them emigrated south and mingled with the nomad Tatar, Kirghiz, and Kalmycks. In this way Western Siberia first became part of Russia.

The rich furs of the Siberian taiga tempted the Cossacks and trappers farther and farther to the east: they advanced from the Irtysh to the Ob, from the Ob to the Yenissei, and then on to the Lena, the Yana, the Indigirka, the Kolyma, the Anadyr,

right as far as Kamchatka and Cape Chukotsk. The whole of Siberia was discovered and occupied with astonishing speed, in the life of one generation. Yermak's Siberian campaign took place between 1579 and 1583 and in 1639 the Cossacks, the first Russians, reached the Pacific. These early travelers were given the name of "land traversers." All advances were made along the rivers; the waterways were the only roads and the tributaries of the big Siberian rivers all flow east to west or west to east. The epic of the exploration and conquest of Siberia by a small handful of Cossacks who suffered untold privations and often perished without leaving any trace in their battles with the native tribes, has been likened to the conquest of South America by Cortez and Pizarro. In Siberia furs took the place of silver. Following in the wake of the Cossacks came the tsar's military governors and officials; they built blockhouses, forts and townships at the confluences of rivers or on the portages between rivers. Many of the present Siberian towns grew out of fortified outposts—Tobolsk, Tomsk, Irkutsk, Yakutsk, Verkhoyansk, and others. A tribute called *yasak* was laid on the natives and had to be paid in furs—sable, ermine, squirrel, and fox. For two hundred years Siberia was a source of fur supply for the Russian Tsars—furs were the currency of the period.

The mass transportation of criminals to Siberia began at the end of the eighteenth century. Parties of convicts, their manacles clanging, marched from prison to prison under an escort of soldiers along the great Siberian road. Amongst them were murderers and cut-throats gathered from the whole of Russia and simple serfs who in some way or another had offended their masters. Amongst those exiled there were also many "state criminals," revolutionaries who had raised their voices against the autocracy—the Decembrists and the Petrashevsky group (Dostoyevsky was amongst the latter), then later Populists and Social Democrats all found their way to exile in Siberia. Lenin, Stalin, and many other Bolshevik leaders suffered exile in Siberia. The

Russian people of those days composed many sad songs about Siberia.

Little was known in Russia of the tremendous riches of Siberia, her minerals, fertile lands and forests. The tsarist government underestimated the importance of Siberia. "Nevsky Prospect alone is five times more valuable than the whole of Siberia," wrote Prince Meschersky, a publicist who was a mouthpiece of the tsar's government. After the abolition of serfdom there was a rush of peasant emigrants to Siberia; the emigrants suffered untold hardships on their journey through Chelyabinsk into the free open spaces of Siberia. Many of them died on the way. The tsarist government tried to keep a rein on this movement; a special Emigration Authority was set up, a certain amount of help was given to the settlers; they were allowed to elect a surveyor to select land on behalf of a family or group that wished to emigrate. The land was given free of charge. Nevertheless the settlement of Siberia was hindered by a mass of formalities and the regulations involved were far removed from Lincoln's famous Homestead Act in the U.S.A.

The Great Trans-Siberian Railway was only built at the end of the last century; it considerably accelerated the settlement of Siberia but even so, at the time of the First World War there were little more than 9,000,000 people east of the Urals, of whom about 8,000,000 were the descendants of Russian, Ukrainian, and Byelorussian Cossack "land traversers," runaway serfs, convicts, and later settlers; the native Tungus (Evenks), Buryats, Yakuts, Oirots, and others totaled altogether less than a million. The conquest of Siberia by the Russians meant that the country was raised to a higher economic and cultural level and was in general progressive. Under the social conditions existing at that time, however, the process was contradictory with many dismal features. The native Siberian people lived a hard life; the traders made them drunk with vodka and then bought up their furs for a song; dishonest officials who collected taxes plundered the

illiterate people mercilessly; various epidemic diseases were rampant amongst the native population. There were practically no natives who could read and write, the native peoples had no written language of their own and they had but a poor knowledge of Russian. Some of the people died out altogether. It is, therefore, not astonishing that one of the Siberian explorers, Golovachev, wrote in 1902: "The time is not far when huge expanses of Siberian territory will become unpopulated deserts."

Such was the history of Siberia up to 1917. Siberia was explored and settled first by the Russian people; the tsarist government, however, turned the country into a gigantic prison and left nine-tenths of the territory completely uninhabited. Siberia developed as a narrow strip of country along the railway and even this development was slow; Siberia as a whole remained a backward outpost of the Empire.

In the course of our travels we shall see how Siberia changed after the Revolution.

III. INDUSTRY IN SIBERIA

OUR aircraft lands at Omsk where we take our places on the Trans-Siberian express. The railway runs through southern Siberia where farming is most highly developed and the population is densest. The big Siberian towns sprang up and developed at the points where the railway crosses the big rivers—these towns are Omsk, Novosibirsk, Krasnoyarsk, and Irkutsk.

At Omsk the railway runs dead straight across a level plain. Along this line identical trains run in both directions, long strings of hopper cars containing Kuznetsk coal and Magnitogorsk iron. They travel at great speed and form the link which makes Kuznetsk and Magnitogorsk one complete whole. Ultra-modern technique, industry organized on a gigantic scale—this is the first thing that catches our eye in Siberia.

On either side of the railway there is wooded steppeland broken up by plowlands, birch groves, and small lakes. This is the

land of grain and butter. We see whole columns of tractors working their way across fields that have no hedges.

As we approached the Irtysh River (as we would if we had come this way by rail and not by air) we saw the town of Omsk where there are large numbers of flour mills and a big plant turning out farm machines. Where the railway crosses the Ob there is the most important city in Western Siberia, Novosibirsk. As we cross the bridge we get a wonderful view of the city standing on a series of terraces over the right bank of the river. The town was founded when the first workers arrived to build the railway bridge across the Ob. The advantageous position of Novosibirsk at the junction of the railway and the great waterway made for very rapid development. Novosibirsk has been called the "Siberian Chicago." In 1939 the population was already half a million and during the war there was a further big increase. The many and varied engineering industries of Novosibirsk developed very rapidly during the period of the Five-Year Plans and still more rapidly during the war when the Novosibirsk factories began turning out arms and equipment for the Red Army. The food packing industry is highly developed and the light industries are growing. A Siberian affiliate of the Academy of Sciences of the USSR was recently founded in the city. Novosibirsk boasts of being the capital of Siberia and indeed its fine wide streets with their huge buildings, the splendid new theater with its huge dome and the beautiful railway station might well be envied by many other cities apart from those of Siberia. Soviet Novosibirsk is a huge industrial center with tremendous prospects ahead of it.

At Novosibirsk a branch line leaves the Trans-Siberian for Barnaul and Semipalatinsk where the Turksib railway begins. Barnaul is in the Altai steppes, the best farming region in Siberia. The chief crops are wheat and sugar-beet, the latter a newcomer to the region.

The Oirot Autonomous Region is in the Altai. Before the Revolution the Oirots led a nomad life with their herds in the

valleys of Altai. Their homes were the *choom*, a wigwam of poles and bark. Their animal husbandry was primitive and the people were poor. Most of the Oirots have now settled, have formed collective farms and around their villages have broken the earth to plant vegetable gardens and fields of grain.

The steppes rise until they merge into the densely wooded mountain slopes covered with larch, cedar, and birch; still higher are the alpine pastures and above them the rugged crags surmounted by snow caps. These are the same Altai Mountains which we saw from Irtysh when we were in Kazakhstan.

The two streams that merge to form the Ob, the Katun, and the Biya, both rise in the mountains of Oirotia. The Biya flows out of the beautiful mountain lake of Teletskoye. The savage beauty of this lake and its environs attracts many tourists from Moscow, Leningrad, Kiev, and other cities of the USSR.

To the southeast of Novosibirsk, in the hilly steppe that lies between the Kuznetsk Alatau and the Salair Range, both spurs of the Altai, is the Kuznetsk Coal Basin, the fuel end of the Kuznetsk-Magnitogorsk Combine. This is undoubtedly one of the biggest coal deposits in the world. The coal there amounts to five times that of the Donetz Basin and two and a half times the coal in all England. The estimated deposits of coal at Kuznetsk are about 300 times the total amount of coal burnt per annum throughout the whole world. In some places the coal seams are 53 feet thick. The coal lies near the surface and is cheap to mine. The various types of coal found at Kuznetsk are of high quality, they contain little sulphur, have a low ash coefficient, and provide fuel, coke, and chemical raw materials.

The Kuznetsk coal field has been surveyed almost in its entirety in Soviet times; before the Revolution only sufficient coal was mined to supply the Trans-Siberian Railway. Soviet Kuznetsk has grown beyond all recognition—its map is covered with new signs indicating coal and iron mines, power stations, coke ovens, blast furnaces, housing estates, and railways. "Make the Kuznetsk Basin a second Donetz" was the task set by Stalin in

the program of industrialization. Before the Second World War the Kuznetsk Basin was providing 20 per cent of the total coal output of the USSR.

In the city of Stalinsk in the Kuznetsk Basin a new iron and steel mill has been built. At first this plant worked exclusively on ore brought from Magnitogorsk. Today part of the ore that is smelted comes from the new mines that have been opened in the vicinity. In Kemerovo, another new city in the Kuznetsk Basin, there is a big chemical plant and a power station. In still another town there is a zinc refinery. During the war aluminum was added to the Kuznetsk industries. A new railway, part of which has been electrified, was built from Novosibirsk to Kuznetsk before the war. The total population (in 1939) of Anzhero-Suzensk, Kemerovo, Leninsk, Prokopyevsk, Stalinsk, and other Kuznetsk cities was over a million. During the war these towns became important inland centers to which Soviet industries were evacuated; in view of this the towns have grown considerably. It was in this region, at a time when industry was never dreamt of, that Dostoyevsky lived in exile.

The Trans-Siberian Railway skirts the northern edges of the Kuznetsk Basin leaving the whole of the huge industrial region on the right. To the north of the railway and connected to it by a branch that joins the main line at the Taiga Station, lies the city of Tomsk, an important Siberian cultural center. Here there is a big university and a number of colleges.

To the north of Western Siberia lie the Khanty-Mansi and Yamalo-Nenets National Areas; even here, in these formerly savage regions, there has been considerable economic development and both industry and agriculture are making progress; in the extreme north of these regions the reindeer breeders and fishermen have formed co-operatives. The natives of these regions live approximately the same type of life as those who live in the tundras around Archangel. Fishing plays an important role in their economy. Big fish canneries have been built on the Ob, in Naryn territory.

After passing Taiga Station we enter Krasnoyarsk Territory. The land here begins to rise and the conifer forests are denser. The trains run through a long stretch of real taiga before entering the city of Krasnoyarsk.

The city lies on the left bank of the mighty Yenissei; at this point both banks of the river are steep and rocky. A short distance upstream from the city and on its right bank are the famous Pillars, a group of high weather-worn rocks that have something of the appearance of human figures. This district has been turned into a National Park and is a favorite place for excursions. Krasnoyarsk itself is a big and busy city that has grown particularly during the past few years. The growing industries are mostly on the opposite bank of the Yenissei where a huge engineering works occupies a tremendous area. Siberia now makes locomotives and harvester combines.

The Yenissei is navigable from the extreme south to the Arctic Ocean; it is the main artery of Krasnoyarsk Territory.

Around the upper reaches of the Yenissei, to the south of the railway line, there is the Minusinsk Depression, a hollow entirely surrounded by high mountains; the Depression provides excellent farmlands and has rich coal deposits. In the foothills of the Altai and part of Krasnoyarsk Territory, is the Khakassian Autonomous Region. This again is a small area of steppeland surrounded by mountains. Khakassia is rich in minerals—coal, iron, and barite, the last supplying the varnish and paint factories of the Soviet Union. The center of the region is Abakan. A branch line has been built from the Trans-Siberian railway to Abakan in Soviet times.

The main industries on the middle and lower reaches of the Yenissei are gold-mining and lumbering. The gold-mines are mainly in the Yenissei taiga and along the lower reaches of the River Angara. The sight of gigantic dredgers working in the middle of the dense taiga is one that always causes astonishment. Surrounded by impenetrable swamps and mountains, hundreds of miles from the railway, there are these huge mining installa-

tions each one of which would require more than a single goods train to carry it when dismantled. The visitor always wonders how these huge machines, as tall as a three- or four-storey house, were brought there.

IV. THE ROAD THROUGH THE ICE

TIMBER is floated down the Yenissei to Igarka, a new town and lumber center lying beyond the Arctic Circle over 400 miles from the river mouth. The Yenissei is so broad and deep, however, that ocean going steamers can steam right up to Igarka. Trips to Igarka for loads of timber form one of the regular operations of the Northern Sea Route Administration—the body that runs the through west-to-east passage along the northern coast of Siberia; we saw one end of this sea lane when we visited Archangel.

The history of the Northern Sea Route is one of the most heroic pages of the story of Russian economic penetration, not only into adjacent lands but also into the seas that wash the shores of the country, including the dreary icebound arctic wastes. In the sixteenth and seventeenth centuries the Russian fishermen and sealers of Pomorye, the northern littoral, and Cossack "land traversers" made their way in tiny cockleshells of boats, sometimes under sail but more frequently using their oars, through the open spaces between the ice floes in the estuaries of the great Siberian rivers. One of them, Semyon Deczhnev, passed through the straits between Asia and America a hundred years before Behring and was the first to pass from the Arctic Ocean into the Pacific. The reports sent in by these bold mariners were lost in the records of the Moscow chancellories and in the eighteenth century the Russians had to begin exploring the Siberian coast almost from the beginning again. The ice fields of the Arctic were regarded as impenetrable and there were few people who ever dreamt that man would one day conquer them. One of the first to realize the possibilities of naviga-

tion in the Arctic was Lomonosov, the first Russian Academician who was himself a native of Pomorye. Only a few isolated explorers made the attempt to find a sea route along the whole northern coast of Siberia. In pre-Soviet days the through journey was made by the Swede Nordenskiöld (1878–79), the Russian Vilkitsky (1914–15), and the Norwegian Amundsen (1918–19), but each of them took two seasons and spent the winter in camp on the way. The necessity for spending the winter in an icebound camp deprived the northern sea route of any practical significance. The planned study of the Arctic brought new possibilities to light. After the Revolution dozens of arctic stations were established, new expeditions were sent out, a close study of the drift of the ice and of the weather was made and aerial reconnaissance of the ice fields was introduced. Gradually man conquered the whole sea road. At first the two ends were opened up to navigation: the first regular services were from Archangel and Murmansk to the mouths of the Ob and Yenissei—we have seen these already—and from the Pacific to the mouths of the Lena, and the Kolyma (mostly to supply food and equipment to the Kolyma mining region). In 1932, the icebreaker *Sibiryakov* made the entire journey in one navigation season. Since 1935 the Northern Sea Route, the famous North East Passage of which sailors of all European nations had dreamed for more than 300 years, was opened for regular traffic. In 1936 fourteen Soviet vessels made the through journey.

This success was to a great extent due to the fact that the Soviet Union had built a number of powerful icebreakers for the Northern Sea Route. The old icebreakers (amongst them the *Krassin* which rescued Nobile's Italian Polar Expedition), were supplemented by new ones. The biggest of them is the *Joseph Stalin*. The icebreakers were set to work over definite sections of the route as escorts to single vessels or convoys. The icebreaker is a Russian invention. The idea was first propounded by Admiral Makarov, a famous explorer who was killed in 1904 during the Russo-Japanese War. He built the first icebreaker, the *Yer-*

mak, which worked in Leningrad harbor. For a long time, however, few people were interested in the navigation of the arctic seas and the matter ended with the building of the Yermak; the tsarist government would not even allow Makarov to make an arctic voyage in his icebreaker.

V. THE DEEPEST LAKE IN THE WORLD

GOING east from Krasnoyarsk we by-pass the Chermkhov coal field and come to Irkutsk, the most important town in Eastern Siberia. Irkutsk Region lies to the west of Lake Baikal on both sides of the River Angara. The southern part of the region, along the railway, is given over to farming, the northern parts to the fur and gold industries. The chief gold fields in Irkutsk Region are at Bodaibo on the River Vitim, a tributary of the Lena where the Lena Goldfields Company had its concessions before the Revolution. Exploitation of the fields is now in the hands of the Soviet State. The present Bodaibo is a rapidly growing Soviet town. Its population exceeds 20,000. The streets are lighted, there are motorbus services, and cinemas and clubs have been built.

Irkutsk itself is on the right bank of the Angara. The railway station is on the left bank and is connected with the city by a long, new bridge. The city possesses a number of colleges and an excellent museum containing many Siberian antiquities. In Soviet times an engineering works has been built to supply machinery for the Siberian mines. The massive mansions that once belonged to the Siberian merchants are a reminder of the time when Irkutsk was the gateway to the rich furs and gold of the Lena Basin, to the huge Transbaikal region and to the Far East.

The Angara is a powerful river taking its waters from Lake Baikal. The regular flow all the year round makes it an excellent site for power station construction. In the future the Angara and several other rivers will be harnessed to provide the power that

will give the stimulus to industry and change the whole economy of Eastern Siberia. This, however, is a matter for tomorrow.

LAKE BAIKAL

Area: 13,197 square miles.

Length: 420 miles.

Greatest Width: 47 miles.

Greatest Depth: 4,725 feet.

Origin: Tectonic age of Lake Baikal is at least Tertiary (some investigators place it in the Jurassic). There is tectonic activity in the shores of the lake even today.

Rivers: Flowing in: Selenga, Barguzin, Upper Angara. Flowing out: Angara.

Water: Transparent to a depth of 130 feet and exceedingly cold.

Fauna: Very rich, 550 known varieties of which three-quarters are endemic.

The railway follows a narrow corridor through the hills to Lake Baikal, a distance of forty miles from Irkutsk. The gorge grows narrower and ends abruptly. The greenish-blue lake lies before us surrounded by its steep, wooded shores. The Angara flows out of the lake at great speed and its transparent waters do not freeze even in winter. In area the lake is much smaller than the Baltic Sea but it is so deep that the volume of water it contains is greater than that of the Baltic. Baikal is icebound from January to May.

The railway goes round the southern side of Lake Baikal; for dozens of miles it runs along the edge of the water, sometimes diving into tunnels (there are about 50 of them), at others going from crag to crag over long viaducts. The building of this part of the Trans-Siberian railway was a Russian technical triumph. It was only completed in 1905 by which time the Trans-Siberian Railway was well developed and trains were carried across the lake on ferries. The ferries were built like icebreakers so that the passenger traffic would not be interrupted during the winter. The traffic capacity of the line was greatly increased

when a path was cut for the permanent way through the rocks that surrounded Lake Baikal.

The journey by rail around the Lake Baikal shores is one of uncommon beauty—from bridge to tunnel and tunnel to bridge. . . . It is a journey that can never be forgotten.

The Buryat Mongol Autonomous Republic begins on the eastern side of the lake. The republic is one of the most important cattle-breeding regions of the USSR. The state and collective farms breed horned cattle, horses, and sheep. In recent times thoroughbred cattle have been introduced and new premises built for them. Industry has come to Buryat-Mongolia: at Ulan Udeh, the capital, (formerly Verkhne-Udinsk) there is a big locomotive works. The plant's housing estate contains three times more people than the whole of Verkhne-Udinsk before the Revolution. Other industries are a glass works, the biggest meat-packing plant in Siberia, wolfram mining (in the south) and gold mining (in the north). There are fish-canning plants on Lake Baikal.

After leaving Ulan Ude the railway climbs slowly up the Yablonovy Range. Here one gets the impression that the sky is higher and wider. Then the train runs into the wide valleys of the Transbaikal regions where forest and steppe alternate, plunges into a tunnel through the water divide and into the town of Chita. Chita stands on the River Ingoda which falls into the Shilka: the Shilka and the Argun join to form the Amur. We are therefore now in the Pacific Basin.

We have already crossed Siberia. Where are the traces of the dismal past? Where are the memories of penal colonies and exile? They are nowhere to be found. Everywhere we see building going on, building for a new way of life.

VI. THE COLD POLE

THE Yakut Autonomous Republic which forms part of the R.S.F.S.R. lies to the north of the parts we have visited, well

away from the railroad and between the big rivers that flow into the Arctic Ocean. It has an area of 1,154,000 square miles; it is bigger than any of the other autonomous republics of the R.S.F.S.R., or any of the other constituent republics. Five Frances could fit into this area.

The winter in Yakutia is long and severe. The frosts last from six to eight months. Mercury freezes. The rivers are hidden under a sheet of ice six feet thick. This is the cold pole, the coldest spot on the earth. At Verkhoyansk the thermometer once recorded a temperature of 70° below zero Centigrade. The winter in Yakutia, however, is dry and windless and is therefore comparatively easy to bear. The average July temperature in the city of Yakutsk is the same as that of Moscow. Wheat and vegetables will grow to maturity and even melons will ripen.

The whole of Yakutia lies in the eternally frozen soil belt, where the permanently frozen subsoil reaches a depth of 650 feet. This does not prevent farming; there is very little rain and the moisture in the thin surface layer that thaws in summer takes its place. Even the larches of the Yakut taiga make the best of the frozen subsoil—they have a root system that spreads out flat like a plate.

Yakutia is very sparsely populated. The villages are scattered over the huge, flat depression with numerous lakes that form the central part of Yakutia and along the Vilui, a left tributary of the Lena. Over 80 per cent of the population are Yakuts. They have been freed of the exploitation of the toyons, the local princelets, and of the merchants.

The Yakut Republic is developing rapidly and in many directions. Today the people are not only engaged in fur trapping but also in gold mining, coal mining, leather tanning, and fish packing. Yakutia's gold fields are of importance to the whole Soviet Union; they are amongst the biggest in the whole world. The Yakuts have been given a written language for the first time and there are now theaters, a pedagogical institute, a number of technical schools, and many general schools. Writers, artists, and

scientists from amongst the native Yakuts have many interesting works to their credit.

The communications are also new in Yakutia. Today one can go from the River Angara to Ust-Kut on the Lena by a new motor road and then by steamer to Yakutsk (about 1,200 miles up the Lena). The Lena is one of the most beautiful and majestic rivers in the world. In some parts it is as wide as a lake, in others it is squeezed between high rocky banks. The cliffs are well wooded. You can also go to Yakutsk by sea through the new port of Tixie, founded in 1933, at the mouth of the Lena—that is you can go by the Northern Sea Route. You can also get to Yakutsk from the station of Bolshoy Never (to the east of Chita) by a motor road that runs due north through a pass in the Stanovoy Range. The easiest way of all is to go by air. The airplane covers in a few hours great expanses of land that formerly took weeks to cover.

VII. ON THE OTHER SIDE OF THE CONTINENT

EAST of Chita the railway runs parallel to the Amur but at a distance varying from 30 to 90 miles to the north of it, so that for the time being we shall not see the river. We cross a few more mountain passes in a wild uninhabited district—larches with low branches and scanty needles, burnt tree stumps in swamps filled with hummocks, a brilliant mass of untouched flowers amongst the stones.

The gloomy larch forests end with the mountains. We now come to a wide open plain with isolated but bushy trees—lindens, walnuts, and oaks; we had to travel across the whole of Siberia before we again came to these broad-leaved deciduous trees in the Amur valley; now we see them in their East Asian form—the Amur linden, Manchurian walnut, and Mongolian oak. The soil closely resembles *chernozem* both in color and fertility. The grass grows to the height of a man. The plains are

extensive and all nature is mild and pleasant. This is the beginning of the Soviet Far East.

The Far East is the very edge of the Soviet Union. This is the line where the biggest continent and the biggest ocean meet. The combination has made the flora and fauna as well as the landscape peculiar to the district.

The east is, indeed, "far." Remember how many days it would have taken to make the journey by train from Moscow. The distance becomes all the more astonishing when it is expressed in time; it is not only a matter of the nine days we have been traveling in the express but also in the actual difference in astronomical time. Khabarovsk is seven hours and the Chukotsk Peninsula ten hours ahead of Moscow. If the passenger does not put his watch forward an hour every day he will find it difficult to accustom himself to the difference in time when he arrives in Vladivostock: for a few days he will find it difficult to get up on time and at night he will have no inclination to go to bed.

We are now crossing the Zeia-Bureia lowlands; these two rivers, the Zeia and the Bureia, are big left tributaries of the Amur. The area that lies between their lower reaches is the most densely populated part of the Soviet Far East.

The railway crosses the wide Zeia by a bridge at the town of Svobodny and runs into the region between the two rivers. At the big station of Kuibyshevka in the midst of pine forests on the banks of the Tom there is a branch line that goes to Blagoveshchensk at the confluence of the Zeia and the Amur. The whole of this region between the Zeia and the Bureia, between the main railway line and the Amur, has been cleared of forest and put under the plow. This is the oldest steppe region of the Far East where grain is grown not only for consumption but for the market.

The farm belt contains over 1,300,000 acres of plowland, more than half the cultivated area of the whole Far East region. Nevertheless, there is still a lot of unused land. This is the bread basket of the Far East, the chief grain-growing district.

At the railway stations there are elevators and in the big villages there are creameries and flour mills; many tractors and combines are in use and the collective farmers are building houses for new settlers. Far across the fields we can see the tall buildings of the flour mills in Kuibyshevka. For the first time in history orchards have been laid out in the collective farms.

The industrial and cultural center of the Amur Region is Blagoveshchensk (60,000 inhabitants). The town is situated on the low bank of the Amur near the mouth of the Zcia. Its long wide streets run parallel to the Amur.

On a number of occasions when the Amur has been particularly swollen its waters have flooded Blagoveshchensk. In 1872 the floods were so bad that small steamers sailed down the main street.

The biggest building in the city is the five-storeyed new flour mill; there is also a big biscuit factory. Other industrial products are sunflower-seed oil, leather and felt footwear. A match factory and lumber mills use the timber that is floated down the Zcia. An engineering works provides machinery for the gold fields. During recent years new colleges and a theater have been opened in the town.

Blagoveshchensk stands on the frontier of the Soviet Union; the Amur is a stone's throw from the center of the town and from its wide boulevards we can see the other bank of the river where there is the Manchurian town of Sakhalyan.

After crossing the Bureia the railway gradually draws nearer the Amur. The line is some twenty miles from the river when it plunges into the Lesser Khingan Range. The railway takes the shortest route over this mountain barrier and then emerges on to the plains again. The Amur, however, turns south and runs along parallel to the mountains until it finds an opening through which it again turns east after a confluence with the Sungary. In its struggle with the mountains the river departs from the straight line of the railway to a distance of some ninety miles to the south. In the plains the railway and the river again draw

nearer but actually meet only at Khabarovsk a distance of nearly two hundred miles from the mountains.

The area between the railway and the Amur which is intersected by two rivers, the Bira and the Bijan, has been settled during the past fifteen years. Jews from the western regions, from the Ukraine and Byelorussia, played an important part in the settlement of this region; other Jews came there from abroad. The Soviet government placed land grants at the disposal of the Jews and in this way the Jewish Autonomous Region, also called Birobijan, was built up.

Emigration to the region was voluntary but it was organized and supported by the Soviet government and has been in progress ever since 1928. Before that time it is doubtful whether there was a single Jew in the whole region. The district is fabulously rich but required very hard work to develop it. The first settlers came into a wild district with no roads, heavy soil, a climate to which they were not accustomed and frequent severe floods. Gradually the first collective farmers overcame all these hardships. The climate and soil permit good mixed farming. In the course of ten years the area under cultivation was doubled; the chief crops are wheat and soy beans.

The lush pastures and excellent meadows make animal husbandry profitable; orchards have been planted and the abundance of wildflowers gave rise to bee-keeping on a large scale.

The clayey, black podzol soil of Birobijan is very fertile but it required draining. Most fertile soil is still covered with forests which must be uprooted. In order to extend the culturable area virgin soil must be broken and the turf that has covered it untouched for countless centuries must be turned over and broken up.

The cultivation of the Birobijan plains by Jewish and Russian settlers has only just begun; the cultivated area is still not more than one per cent of the whole region. Hundreds of thousands of acres still lie untouched.

The town of Birobijan, capital of the Region, stands beside

a high isolated hill on the railway; the town was originally a farming center but has recently gained importance as an industrial town. Furniture, clothing, and other light industries are developing. Many of the Jews who came here from the Far East were craftsmen by profession and found farming too much for them to cope with; they stayed, however, and their able hands helped build up the industries. The basis for a light industry in the Soviet Far East is being laid in Birobijan.

The town of Birobijan bears all evidence of its youth. Much is still in the embryonic stage although there are a number of big, well-constructed buildings—schools, a fine railway station, a big printing works, a hotel, and a beautiful cinema designed on classical lines. There are asphalt sidewalks to the central streets and a splendid park on the banks of the Bira.

The town stands on the edge of a huge flat plain which stretches from the Lesser Khingan to Khabarovsk. Tributaries wind slowly toward the Amur between low banks down a scarcely perceptible slope. This region is sometimes called a prairie but it is too damp to justify such a title. The one thing it has in common with the prairies of North America is the tall grass which grows to the height of a man, but which has long since disappeared from the American prairies.

The parts that have been put under the plow are intersected with drainage canals. The oak groves that once stood on the higher lands have been rooted up. The ground soon dried when it was freed from the dense covering of tall grass and the breeding grounds of the mosquitoes were destroyed. The new fields grow grain and vegetables. Today one sees whole strings of tractors working in the fields and the first combine for reaping soy beans has already been introduced.

VIII. THE CITY ON THE AMUR

Our train enters Khabarovsk over a long bridge across the Amur. For over a thousand miles the Amur has been flowing parallel to

the railway but has been hidden all the way by the irregularities of the terrain. The passenger traveling to the Pacific sees this grand old river for the first time when crossing the seemingly endless bridge at Khabarovsk. The power represented by the river is tremendous—a tempestuous rush of dark brown water with numerous whirlpools flowing between wide banks.

The Amur is the backbone of the Khabarovsk Territory. It is one of the biggest rivers in the world. It is formed by the confluence of the Shilka and the Argun and if we include the Shilka and its tributary the Onon the Amur is 2,800 miles long, that is about 500 miles longer than the Volga. The Soviet-Manchurian frontier runs along the Amur and the Argun for over 1,200 miles. The Amur was the road which led the Cossack “land traversers,” the first Russians in the Far East, to the Pacific some three hundred years ago.

Khabarovsk has all the signs of a rapidly growing city; altogether it is less than a hundred years old and it is only in the Soviet period that building really began there.

The main streets go down to the Amur along the ridge of a wavy hill; the blocks of houses lie between them in the hollows. The big new buildings are built on the ridge itself and from a distance they look like skyscrapers as they stand high above the old town. This is the Khabarovsk of today. To one side of the main arterial road which is asphalted and lined with big buildings, there are winding streets with board sidewalks lying down in the hollows and lined with small log houses. This is what is left of the Khabarovsk of yesterday.

Soviet Khabarovsk is a big industrial center with a number of big engineering plants, important flour mills, shipyards, furniture factories, and many other enterprises. In 1939, the population was already 200,000, that is four times as many as in 1926 and thirteen times as many as before the Russo-Japanese War. The trade and commerce of Khabarovsk, its position and its manufactures, serve to make it the capital of the huge Far East

region. All the organs controlling the economy of this gigantic area meet at Khabarovsk. Geological expeditions are sent out from here, here are the bodies that control the fulfilment of economic plans, here scientific work has developed.

Thousands of small but noticeable symptoms warn us of the nearness of the Pacific along the shores of which the Soviet Far East spreads. In the city park there is the huge skeleton of a whale. The local newspaper is called the *Pacific Gazette*. In the shops fresh Pacific fish is on sale.

Let us make the last lap of our journey with all possible speed. The Trans-Siberian Railway ends on the shores of the Pacific at Vladivostok.

IX. THE SHORES OF THE OCEAN

THE railway from Khabarovsk to Vladivostok goes almost due south along Ussuri, the big right tributary of the Amur. We are separated from the Japanese Sea by the steep mountains of the Sikhote-Alin, densely overgrown with the Ussurian Taiga. The whole area is undulating, densely covered with deciduous forests which begin to thin out as we go south. Then begins a huge grass-covered plain with occasional isolated trees. Here and there are isolated, conical hills which in the north are covered with trees and in the south with bushes. There are dense forests in the plains only along the rivers.

In the west, across the Ussuri River, lies Manchuria. In the east we can just see the outlines of Sikhote-Alin mountains on the horizon.

The rivers which flow from the mountains cross the railway before reaching the Ussuri; timber is floated down these rivers from the mountain forests and is carried to its destination by the railway. At the points where the railway crosses the tributaries of the Ussuri there are big sawmills; these are the most important economic centers of the Ussuri valley. They are mostly

known by the names of the rivers—Khor, Bikin, and Iman. Where the Ussuri itself crosses the railway there is the new town of Lesozavodsk (Sawmill Town).

All these places are very much alike: long bridges over the rivers whose banks are covered with brush; huge piles of timber; the tall chimneys of the sawmills; big housing estates for the workers. These timber centers have grown considerably during the past few years.

With the Ussuri Valley behind us our train approaches Spassk. The groups of whitewashed houses lie on the gentle slopes of a hill. On a limestone hill near the town there is the Spassk Cement Works, the industrial heart of modern Spassk. Near the small pre-war factory there are huge new concrete buildings and a tower. By this time we have almost come to the end of the forest and the hills are bare. From the hill on which the cement works is built Lake Khanka can be seen sparkling in the distance whenever there is a fine sunset.

The town of Voroshilov (formerly Nikolsk-Ussuriisky) stands on the River Suifun which flows into the Amur Bay on the Sea of Japan. At one time this town was the smuggling center of the Far East, the place that specialized in the underground opium traffic. Today it is an industrial and cultural center in an extensive farming region. Rising high over the town is the tower of the new oil and fat combine; this is a big enterprise which produces oil, oilcake, glycerine, and soap from soy beans. Near the town there is a sugar refinery which deals with the sugar beet that is now grown in the Far East.

Voroshilov is like a Ukrainian town, the same white houses with blue shutters, the same soft dust, poplars along the streets but unlike those of the Ukraine they are not pyramidal. The collective farmers in the surrounding villages are descendants of the Ukrainians who settled here long ago; there is still much of the Ukraine in their villages—little white cottages. Ukrainian interiors and Ukrainian speech. The names of the villages are also Ukrainian—there is Poltavka, Chernigovka. . . . The dis-

tant mountains, however, serve to remind us that there is no Ukrainian steppe in the vicinity.

Voroshilov is not far from the sea. The railway runs down the narrow valley of the Suifun, through a tunnel and on to Amur Bay. The line runs close to the water, the water of the Pacific.

We run into Vladivostok. When the first snow is falling in Khabarovsk the people of Vladivostok are still wearing summer clothes. The winter, however, comes to Vladivostok by December and although the latitude is the same as that of Naples it is very severe. In the summer when Khabarovsk is quite dry there are rains in Vladivostok.

The buildings of the city stretch all the way along the waterfront—warehouses, workshops, and oil reservoirs. In the bay we see many vessels. At last we reach the noisy streets of the city.

Vladivostok is 460 miles from Khabarovsk at the end of a long, narrow, granite peninsula separating the Amur and Ussuri Bays. A deep, winding bay, the Golden Horn, bites into the high coast.

Around the busy harbor there is an amphitheater of hills with buildings terraced on them. From the sea it seems as if the farther houses are standing on the nearer ones. Throughout the summer and dampness of the ocean lies on the stone paving of the streets. Hanging over the town are the humps of two bare hills—the Eagle and the Tiger. A wonderful view of the town and the Golden Horn and of the island which hides the latter from the sea is to be had from these hills.

Vladivostok's position at the end of the Trans-Siberian Railway accounts for its early growth; large quantities of soy beans were exported to Manchuria through the city.

Present-day Vladivostok is the center of the Maritime Territory, is the chief Soviet port on the Pacific, is one of the finest towns of the USSR and is a scientific and cultural center of the Far East. There are a Polytechnic Institute, the Pacific Institute of Fisheries and Oceanography, a School of Advanced Studies for Teachers, an excellent local museum and an Affiliate of the

Academy of Sciences. Vladivostok's industries are shipbuilding, engineering, refrigerators, and meat and fish packing.

The port of Vladivostok is connected with Sakhalin and Kamchatka by regular steamship services. It is also the base of the Soviet Pacific whaling, crab-catching, sealing, and refrigerator fleets.

X. DOWN THE AMUR

WE HAVE come to the end of the Trans-Siberian Railway but the Soviet Far East is so large that there is still much that we have not seen; let us, then, go back to Khabarovsk and take a steamer down the Amur.

From Khabarovsk the Amur flows to the northeast along a broad valley, the horizon of which is marked by distant hills. The river splits into countless streams and the fairway is difficult to distinguish amongst them. There are tall posts on the banks with the red and white pyramids of the navigation marks. Fishing villages are to be seen on the banks.

Some 220 miles from Khabarovsk the Amur reunites into a single stream and winds round high wooded hills. On the left bank there is an open plain lying in a semi-circle of hills. Right close to the shore and hemmed in by the taiga the fishing village of Permskoye, founded in 1860 by emigrants from Perm in the Urals, once stood.

The hills recede from the river and leave a wide wooded plain. Thirteen years ago the trees of the taiga were uprooted and the foundations of a big engineering center, Komsomolsk, were laid. It was so named in honor of the Young Communists (Komsomols) who undertook the terrific job of building a new industrial city in the jungle.

Above the old fishing village there are now blocks of big brick-built houses. The whole is surmounted by the huge steel structure of the factories. Beyond them new wooden houses stretch as far as the distant hills. The earth has been dug up, rails have

been laid, building is still going on everywhere. It is possible to see the outlines of this young city only from an airplane.

Komsomolsk has a magnificent panorama. Everything tells of strength, of beauty and of the tremendous scale of the building operations. The wide expanses of the Amur, the blue of the distant hills, the conquered taiga, the huge glazed façades of the industrial buildings, the endless rows of houses, the happy and industrious life of the youth, the hardships and the joy of creation. . . .

Young Soviet men and women consider it an honor to work here. This city, built on the distant Amur on the initiative of Stalin, is the embodiment of the heroism of the industrial storm which in the years of the Five-Year Plans changed the face of the Soviet Union and in particular of the Soviet Far East.

Below Komsomolsk, there are more fishing villages along the Amur. Long, narrow islands, overgrown with reeds, lie out in the stream. The wooded hills are near the river in some places, at others they stand on the distant horizon.

The Amur joins the Amgunya, in whose basin gold mining and fur trapping are the chief industries, and then turns east, enters a long narrow corridor in the mountains and bursts out to the sea or rather the Tatar Strait, in a wide estuary; the Tatar Strait separates Sakhalin from the mainland.

The chief industry on the lower reaches of the Amur is fishing, especially important being the catches of the coarser kinds of salmon.

The salmon are not only caught in nets but also in specially constructed traps that are peculiar to the Amur. These traps are long fences in the form of a letter L that are built out from the bank across the current. Each of them is usually several hundred yards long.

When there is a mass invasion of the fish the fishermen are scarcely able to keep them clear of salmon. The work goes on day and night in order not to lose the fish. The year's catch very often depends on a few days in the traps.

The fish is treated in different ways; some is smoked and some is salted on ice.

The town of Nikolayevsk, the gateway to the Amur, stands at a point some 600 miles from Khabarovsk on the left bank of the river. This is the economic and cultural center of the Lower Amur Region, the center of the fishing and gold-mining industries and an important fur center. Nikolayevsk is an important airport; planes from here fly to Kolyma and Kamchatka and the main air route from Khabarovsk to Okha on Sakhalin passes this way.

From Nikolayevsk to the mouth of the Amur the distance is about twenty miles. On both banks of the river there are long lines of fish-packing houses, fish traps, smoking and salting sheds, fishermen's dwellings, and vegetable gardens. Many of the fishing grounds are new while others have been transformed from seasonal fishing camps where the workers lived in mud huts into permanent fish-packing centers where the work is mechanized. There are huge refrigerators at the mouth of the Amur, fish canneries have been opened, the cans are made in local factories and the latest industry is the manufacture of fertilizers from fish offal.

Before entering the sea the Amur spreads into an estuary nine miles wide.

XI. ON THE ISLAND OF SAKHALIN

IN THE nineteenth century Sakhalin was a terrible penal settlement, isolated, the Russian Cayenne, but today we can go to Sakhalin from Nikolaevsk by air.

When we fly over the Amur estuary we can see a delta under the water between two walls of rock.

Sakhalin is a long narrow island shaped somewhat like a fish; its long axis runs north and south. It is separated from the mainland by the Tatar Strait which joins the Okhotsk Sea to the Sea of Japan. The winters here are frosty and there are heavy snow-



CENTRAL ASIA, OLD AND NEW

ABOVE:—Village elders at the Teahouse in a Central Asian town.

BELOW:—A session of the Supreme Soviet of the USSR, with delegates from Azerbaijan in the foreground.





CONTRAST IN THE SOVIET UNION

ABOVE:—*Flowers in the Kara-Kum Desert.*

BELOW:—*Old and new forms of transportation in the Kolyma region of the Soviet Arctic.*



falls. Summer in the north and east—near the Okhotsk Sea—is cool and foggy, in the south, west, and center it is comparatively warm. In the regions that are shut off from the sea by mountains the climate is drier, more of a continental nature; these are the regions of the island most suited to agriculture.

We land at Alexandrovsk. The town lies on the northwest of the island in a valley open to the sea. On the east there are green hills with a gentle slope along which there is a main road leading into the interior of the island. In the south there is a low steep range of hills with coal workings which end sharply at the sea-coast with the rocky Cape Zhonkier. A white lighthouse stands on the cape. Below the lighthouse the waves break against three sharp cone-shaped rocks, the Three Brothers, which mark the roads of Alexandrovsk.

The coastal settlements of this part of Sakhalin are not all connected by road; the people go to town by motor boat. In the places where cliffs stand back some distance from the sea there is the best possible road, a beach that has been ground and smoothed by the waves. The road is open twice a day when the tide goes out; the beach is covered with starfish, jellyfish, and shells at low tide. The Sakhalin newspapers publish the times of high and low tide daily so that motorists should not be caught by the tide.

The basic industries of Sakhalin are coal-mining, timber, fishing, and oil. The coal is found mostly in the northwest. This coal field is not as important from the standpoint of the size of the deposit but on account of its geographical position: it is just where it is needed, on the sea coast where the coal can be easily supplied to ships.

A large part of the island is covered with forests which supply timber for industry. The fallen, rotting trees, the tangle of undergrowth, and the tall grass make the Sakhalin forests impenetrable.

Sakhalin is very rich in fish. The chief fish are salmon and herring.

The oil fields are at Okha in the north where we may go either by sea or air. Okha stands in the Urkt Bay on the eastern shore of the Okhotsk Sea, amidst swampy, scanty woods. The derricks stand on a series of hills, nearby is a town of log houses and on the other side a group of huge oil tanks.

In Okha there are several schools, a technical institute serving the oil industry, hospitals, and vegetable gardens in the suburbs. The taiga has been cleared away and the region made habitable.

Oil was not obtained from Sakhalin before the Revolution, but today it provides fuel for the Soviet Far East.

There is a motor road from Alexandrovsk into the interior of the island. The road runs up a narrow valley to a pass over the mountains. The most noticeable thing about the countryside is the luscious grass. Above us there are light pale purple clouds lying on the mountain tops, below numerous flowers, irises and lilics, amongst the green grass. . . . The forest is dense and jolly, the larches are dressed in a lacework garment of needles.

The silt brought down from the interior of the island is very rich in humus. Farms around here go in for vegetable growing and cattle breeding.

Formerly the north of the island belonged to the Soviet Union and the southern part to Japan. Since the Allied victory over Japan in September 1945, the position has changed: Stalin said in his speech on that occasion: ". . . Southern Sakhalin and the Kuril Islands will pass over to the Soviet Union and henceforth will not serve as a means of isolating the Soviet Union from the ocean and as a base for Japanese attack on our Far East, but as a means of direct communication for the Soviet Union with the ocean and as a base for the defence of our country against Japanese aggression."

XII. THE WHITE SPOT

Our plane takes us across the stormy, foggy and inhospitable Okhotsk Sea. There is a port in Nagayevo Bay on the Okhotsk

Sea opposite the northern tip of Sakhalin. This is one of the best bays on the Okhotsk Sea. Despite the severity of the climate the central part of the sea is icefree all the year round and with the aid of icebreakers convoys of vessels can reach Nagayev or the edge of the shore ice even in the cold months of early spring and late autumn.

The quays are artificial embankments under a steep cliff. Ocean going steamers are standing in port. Beyond a low stony ridge overgrown with small and scanty larches that look like the black strokes of an engraving, stands the town of Magadan. Magadan is a new town, the center of a huge mining district in the basin of Kolyma, an area of about 200,000 square miles; judged on a European scale this would be the territory of a big country. The area stretches from the Okhotsk Sea in the south to the Arctic Circle in the north, joins up with the basin of the Indigirka in the west and the basin of the Omolon in the east.

Until quite recently the geography of this huge region was practically unknown. Soviet scientific expeditions beginning in 1926, soon discovered to their amazement that the existing maps of northeast Siberia were far from being correct. Soviet geographers were the first to describe the huge mountain system known as the Chersky Range which is over 600 miles long and has peaks reaching to a height of nearly 10,000 feet. The mountains do not run radially from the center of an arc formed by the Verkhoyansk, Kolyma and Anadyr Ranges and are not between the upper reaches of the rivers as was shown on the old maps; they run along the arc and the rivers Kolyma and Indigirka cut straight across them through narrow river-worn gorges. It was soon discovered that the Kolyma Range does not form a barrier between the river of that name and the Okhotsk Sea and the river is much nearer the sea than was shown on the map. To cap all this huge deposits of various minerals were found and surveyed in this newly-discovered land and their planned exploitation began during the second Five-Year Plan.

The whole country is covered with sparse larch forests; the

tops of the hills are either bare or are covered with scrub and reindeer moss. In the beds of the valleys that are subject to floods there are forests of willows and poplars.

The climate of the valley of the Kolyma is severe and continental. In the winter the snow gleams brilliantly in the sun during the day. The winter is dry and windless. After the frosty winter comes a hot summer. The days are long, the sun is burning hot and the people soon get tanned.

The Kolyma Highway runs north from Magadan through the mountains. The distance is greater than that from Moscow to Leningrad. The road leads to the mines, refineries, vegetable farms, and the new towns and settlements in the taiga, through country that to all intents and purposes was formerly not on the map.

During the last quarter of a century there is no other country that has changed so much as the Soviet Far East.

XIII. VOLCANOES

THE Kamchatka Peninsula lies to the east of Kolyma Region. Kamchatka is so far removed from the center of the Soviet Union that the very name is now used by Russians to mean something very distant. Schoolchildren call the back benches in the classroom "Kamchatka."

Kamchatka is a windy and foggy peninsula where everything is different: alpine plants grow right beside the sea, there are glaciers on active volcanoes, at Penzhina there is about forty-five feet difference between high and low water, violets grow amidst the snowdrifts beside hot springs, the fish are in such huge shoals that the gulls sometimes stand on the backs of the salmon and peck at them.

Two mountain chains run the whole length of the peninsula with the valley of the Kamchatka River between them. The eastern range is in general lower than the western but the highest peaks are in the east—the famous Kamchatka volcanoes

amongst them Kliuchevskaya Sopka (13,500 feet), the biggest volcano in the Old World.

The volcanoes of Kamchatka are constantly active, and belch smoke and hot stones from their craters. From time to time they emit lava and ashes. During the eruptions the rumbling of the volcano can be heard for miles, a column of gas rises about five miles into the air and at night the hills are covered in flames from the lava. The region is covered with ash for hundreds of miles round. In winter this forms what the Russians call the "non-slip" where skis and sledges get stuck in the snow and will not slide.

At the village of Kliuchi, near the volcano, there is a scientific station which studies the volcanoes. A few years ago scientists and men from the frontier regiment stationed on Kamchatka succeeded in reaching and entering the crater of the volcano (diameter 800-1000 feet, depth about 160 feet). In 1945, a new period of volcanic activity began.

There are many hot springs on Kamchatka, some of which are geysers. The soil around the springs is always warm (some of the springs even emit boiling water), and in the winter there is no snow.

The Kamchatka summers are cool, the coasts are foggy; winters are severe, with heavy frosts, heavy snowfalls, and strong winds. The inner valley is the warmest part in summer and is therefore most suited to farming. On the southeastern, Pacific coast, the sea does not freeze with the exception of a fringe of ice along the shore.

Fishing is the chief industry and is run both by the state and by co-operatives. Kamchatka has been intensively settled during the Soviet period.

Various types of salmon are the chief fish caught on Kamchatka. Between May and October when the salmon come in to cast their spawn they are in such swarms that they fill the water. Herring and cod also provide the fishermen with big catches. In the Soviet period new methods of catching and treating fish

have been introduced. Seine nets and trawls are used both at sea and in the river. Dry-salting has been replaced by smoking and salting on ice. Canning has also been introduced, and Kamchatka sends out hundreds of thousands of cases of canned fish a year.

Kamchatka provides 95 per cent of all the crab caught in the world; the crabs of Kamchatka are sometimes half a yard and even more in diameter. A whole flotilla of floating crab canneries works off the coast. These are big vessels that are based on Vladivostok; they catch the crabs and can them on board ship. The crabs are caught in nets spread on the sea bed during the breeding season when they move about the sea bed in large numbers. Kamchatka crab is well-known all over the world.

There is also a whaling industry in the vicinity of Kamchatka, mostly round the Behring Straits. The whales pass through the Behring Straits in spring when they are on their way to the Arctic Ocean and in autumn they come back the same way to the Pacific. The whalers working in this region are based on Vladivostok.

XIV. THE EDGE OF THE WORLD

NORTH of Kamchatka lies Chukotka, or the Chukotsk Peninsula, a huge, almost uninhabited land in the extreme northeast of Asia. This distant and wild country has a short summer, a long fierce winter—it consists of extensive tundras, and bare hills on which there is snow all the year round.

The natives of this region are the Luoravetlans (Chukchi) and the Nymyllans (Koryaks); they are settled fishers and hunters on the coast and nomad reindeer breeders in the interior. The coastal people fish and hunt seal, walrus, and arctic foxes, the nomads of the interior move from pasture to pasture with their herds. There are also Russians, Yuits (Eskimos) and nomad Evens (Lamuts). What a huge number of different peoples we have seen in the Far East alone—Lamuts, Luoravetlans, Jews, Nymyllans, Ukrainians, Eskimos and, of course, Russians!

There are more Russians than any other nationality. Here as elsewhere throughout the Soviet Union, they play the leading role in the rebuilding of the country.

Chukotka is the most remote region in our country. The nearest big city, Vladivostok, is 3,000 miles away.

In recent years farming has been introduced to Kamchatka.

Petropavlovsk, the center of Kamchatka, lies in the east in Avachin Bay which is joined to the ocean by a narrow strait. It is a splendid natural harbor. The town is surrounded by mountains above which the Avachine Volcano dominates.

In Petropavlovsk there are shipyards, sawmills, brickfields, a power station, and a plant making tin cans, all of which are connected with the Kamchatka fishing industry.

IF WE CONCLUDE our visit to the Soviet Union with a short journey into the future and take a look at the country five years from now, you, reader, must be prepared for a shock. Not all the places that we have visited together will be the same in 1950 and they were in 1946.

Five years is a short space of time but since 1946 much has changed. We no longer see the devastation caused by the German vandals on Soviet territory. In the war area the ruins have gone and much that is new has been added. Forty-five more blast furnaces have started work, 500,000 automobiles a year are rolling off the conveyors of plants all over the country, the iron and steel mills are turning out 19,500,000 tons of iron and 25,400,000 tons of steel a year. In 1950, the country's mines will produce 250,000,000 tons of coal while the collective farms will receive 112,000 tractors a year from Soviet enterprises. The annual grain harvest beginning with 1950 will be 127,000,000 tons.

If we make our 1950 trip by air we shall notice first of all that even the plane is not of the same type as that which we used in 1946. During the preceding five years the aircraft of the USSR will have been completely renewed. Our new aircraft is equipped with the best of everything that world engineering has devised. In accordance with a directive issued by Generalissimo Stalin science and human effort during the past five years have been working intensively in the most promising fields—radio-location, jet propulsion, and nuclear energy for the use of industry and transport.

The passengers that accompanied us on our last journey have changed considerably in the five years that have elapsed. We saw these people in 1946, during the first year after a terrible four-year war. With tremendous courage and patience the people of our country bore the burden of the greatest of all wars. These people were the victors. Today, in 1950, our companions no longer show traces of the hardships and privations they suffered in the years of the death struggle with the invaders. Five years of peaceful life have been enough for the country to accumulate a sufficiency of the major items of primary necessity. There are still no idle branches of industry, the demand for workers is still greater than the supply. Wages are higher than they were in 1946, in fact the annual national income has increased by an average of 38 per cent!

Our traveling companions of 1950 are making the journey for the most varied reasons; no matter what has urged them to make the trip, however, their lives are intimately bound up with the life of their country. In the plane with us there are engineers, scientists, workers, and farm specialists. Some are on their way to join a geological expedition, others are going to a new building site, while a third group is going to a region that is just being opened up to agriculture. The atmosphere reminds us of the Five-Year Plan periods before the war, the whole country has the building fever. In the course of five years the Soviet people have rehabilitated or built anew 5,900 big industrial enterprises.

Our plane circles over Moscow. How new it all seems after five years' absence! The town has spread, new buildings have appeared, the residential districts of Moscow have had another 33,000,000 square feet of floor space added. Gas is supplied for domestic purposes by a pipe line which brings it all the way from Saratov on the Volga. New sections of the Underground Railway are in operation. The streets have a brighter appearance, trees have been planted on many of them.

We follow a route that we know already, to the Volga and then southward down the river. At Gorky on the Volga and at

Kaluga on its tributary the Oka new hydroelectric power stations are working. The engineering industries of the Volga cities have been expanded and new textile mills have appeared. There are many oil fields along the river.

We continue the same journey to the Transcaucasus. The huge Mingeaur Hydroelectric Power Station on the Kura is producing current. The waters of the Kura have been raised by a dam and are used to irrigate hundreds of thousands of acres of formerly untilled land. The iron and steel mills near Tbilisi are working already and the Transcaucasus now has its own metal. New power stations of the Sevan Cascade in Armenia are working. In the Transcaucasus there are new industries—aluminum, oil piping, automobiles. . . .

We continue across the Ukraine. Everything that the Nazis destroyed has been rebuilt. The Donetz Basin is turning out more coal than before the war. The turbines of the Dnieper Power Station have been grinding out current for a long time already. There are many new factories and there are new industries in the Ukraine—the automobile industry for example. All the fields are being tilled. The Carpathian Region has become an industrial center. The “Ukrainian Caucasus” produces oil, potash, and gas. The famous Carpathian Health Resorts have been developed.

Now let us look at Byelorussia. The country has been raised from the ruins and ash heaps and not only produces what it did before the war but in addition turns out automobiles, tractors and bicycles. The peat output has been trebled.

The Soviet Baltic Republics have restored the economy which the German destroyed. The Baltic ports have become busy centers, animal husbandry is again flourishing and industrial output is far above pre-war level—in Esthonia for example, it has been trebled.

Leningrad is below us, that glorious veteran of the great struggle against Fascism. In 1946 we saw the wounds . . . To-day there is not a trace of them. Leningrad is again the northern

metropolis, an industrial and cultural center second only to Moscow. Leningrad industry has been completely rebuilt but it is no longer what it was before the war; the industries are on a much higher technical level, there are new machines and new power stations. Not far from Leningrad a big new iron and steel mill is working. The city has an abundant supply of gas which is piped there from the shale refineries on the shores of the Gulf of Finland. An underground railway has been built. . . .

We fly across the endless forests of the north to the Urals, passing new mechanized lumber camps and saw mills, oil field and gas workings in the Ukhta Region, the coal fields of the Pechora Basin. Everything has changed, everything has grown! Especially has the Pechora Coal Field expanded—it has now become the chief source of fuel supply for Leningrad. Train after train leaves the arctic tundras loaded with coal for the south. . . .

The Urals! This region is still progressing with seven-league strides. Its gigantic industrial concerns are now working for peace and not for war. In 1950 the Urals is producing two and a half times as much iron as in 1940. Steel, copper, gold, machine-tools, railway wagons, automobiles . . . New blast furnaces, new ore mines, new factories. . . .

We turn south into Central Asia. A lot of work has been done here during the past five years. Take Uzbekistan as an example. Today it seems impossible that before the Revolution there was no industry in this country. During the last five years Uzbekistan has built power stations that have a total capacity of almost a third of a million kilowatts! The iron and steel mills are working, a factory is manufacturing artificial fiber, there are superphosphate plants, textile machines are being turned out, while the plants under construction include a nitrogen fertilizer factory, copper refineries and a zinc refinery. . . . Industrial production is almost double pre-war. In the countryside a further 1,500,000 acres of land have been irrigated and planted to cotton, rice, and fruit trees.

We finish our journey into 1950 by crossing Siberia. As be-

fore the eastern parts of our country still continue to progress with particular speed. Beyond the Urals, in the huge expanses of taiga and steppe, industry is developing. Coal, steel, ferrous alloys, non-ferrous metals, tractors, automobiles, fabrics, paper—these are the chief products of modern Siberia.

A huge stretch of the Trans-Siberian Railway—from the Urals to Kuznetsk—has been electrified during the past five years. Today, however, less ore is taken from the Urals to Kuznetsk than in former days: in the course of five years Western Siberia has considerably expanded its own iron mines. Many Siberian towns have developed important engineering industries—Novosibirsk with its huge automobile plant has grown more than any of them. In Eastern Siberia artificial liquid fuel is being manufactured. A second main-line railway is being built to the eastern parts of the USSR. The Far East has increased its economic potential and is producing more iron, machines, oil and grain. . . .

Before we leave, just a glimpse at the Arctic. We see long convoys of ships amongst the ice floes of the Siberian coast. During the last five years the Great Northern Sea Route has become a normal shipping lane.

Thus we find the Soviet Union in 1950. We notice particularly that the eastern areas that progressed very rapidly during the war have continued the same rate of progress during the past five years. In the west the regions that suffered so badly from enemy action have finished their work of restoration.

The destruction which we saw in the west in 1946 was terrific. At the beginning of 1946 in Byelorussia, for example, the total industrial output was only one-fifth of pre-war. In 1950, the war devastated areas are already turning out fifteen per cent more than pre-war. This means that the Soviet Union has completed her restoration after the Second World War in half the time that was required after the First World War when the destruction was on a much smaller scale. . . . Taken as a whole Soviet

industry in 1950 has exceeded the 1940 level by forty-eight per cent.

If the reader ponders a little over the figures contained in the post-war Five-Year Plan which is now being implemented in the Soviet Union, he will easily convince himself of the tremendous forward movement of the Soviet people. He will easily see for himself what the USSR will be like in 1950.

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